Wallacea insignis Spruce ex B. & H. is a common shrub with pink-eyed white flowers along both Caño Temi and Caño Pimichín. The generic name is a token of Richard Spruce's friendship.

A Historic Portage

By J. J. Wurdack

Dr. Wurdack is Associate Curator of The New York Botanical Garden.

A Description of Javita

'Tis where the streams divide, to swell the floods
Of the two mighty rivers of our globe;
Where gushing brooklets in their narrow beds
Lie hid, o'ershadow'd by th' eternal woods
And trickle onwards,—these to increase the wave
Of turbid Orinooko; those, by a longer course
In the Black River's isle-strewn bed, flow down
To mighty Amazon, the river-king,
And, mingled with his all-engulfing stream,
Go to do battle with proud Ocean's self
And drive him back even from his own domain

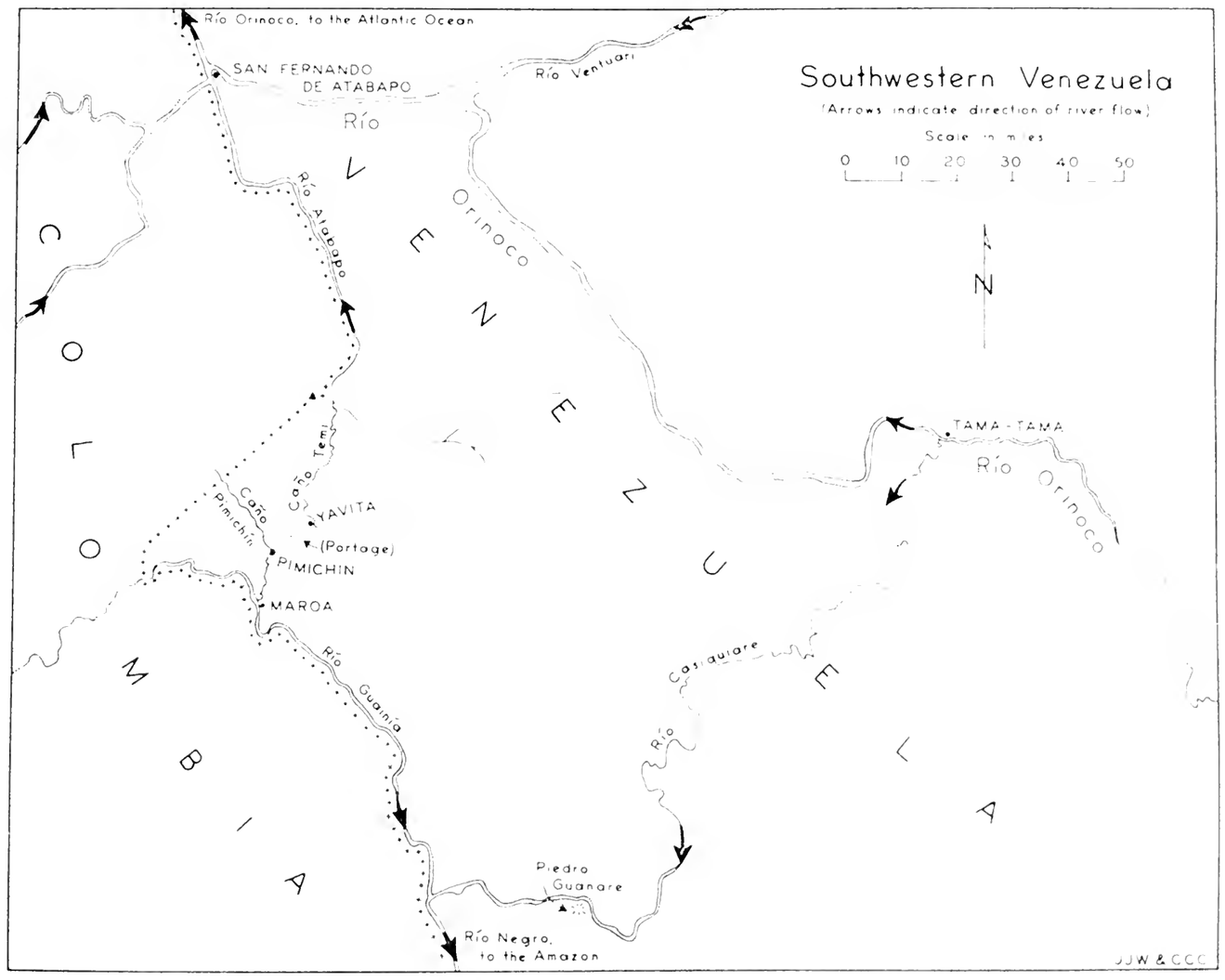
Alfred Russell Wallace

Last year was the centenary both of the death of Alexander von Humboldt and of Darwin's and Wallace's joint publication of a theory of evolution by natural selection. Symposia were held in various parts of the world in observance of these anniversaries. For Humboldt, Wallace, and other pioneer naturalists, one common path in their tropical travels was the portage between the Orinoco and Río Negro drainages in southwestern Venezuela. In their travel writings, both Humboldt and Wallace dwelt at length on their experiences in this region, and undoubtedly their ideas on the tropics were strongly influenced by their stays on the height-of-land.

The Orinoco River describes a gigantic arc of some three hundred and fifty river miles between Tama-Tama and the mouth of the Meta River. Because of the reversal of the Orinoco's course, the all-water trip from San Fernando de Atabapo to the Río Negro via the Río Casiquiare (about four hundred and twenty-five river miles) involves twice as much time as the Río Atabapo —Yavita to Pimichín portage — Río Guainía route (about two hundred miles). Between Caño Temi and Caño Pimichín, the height-of-land is only eleven miles wide, the terrain flat. Indeed Humboldt proposed to King Charles IV of Spain the building of a canal between the drainages to facilitate development of the upper Orinoco–Río Negro area.

For the last one hundred and sixty-four years, the approach from the Orinoco has been the Río Atabapo and its affluent, Caño Temi, to the insignificant port of Yavita. From the Guainía, the sinuous course of Caño Pimichín is followed from just above Maroa to the landing at Pimichín. Both approaches are through flat land with scrub forest and savannas, which are inundated during the rainy season. Inexplicably the entire area is considerably cooler and rainier than the adjacent Orinoco-Casiquiare region. The walk across the portage is predominantly through high rainforest.

Apart from the saving of time, in daily ease of living the portage route has the great advantage of being free from the biting blackflies which becloud the upper Orinoco and Casiquiare Rivers. Thus the short cut immediately became popular among the Portuguese who had been across the divide about 1755. During the middle of the eighteenth century, both Spain and Portugal



New York Botanical Garden
Vol. 10, no. 1. Jan.-Feb., 1960

gle flowers when restarted from dormancy. All these happenings seem to be manifestations of the natural variability of the *Gesneriaceae*, a well-documented characteristic which is the delight as well as the despair of the growing legion of gesneriad fanciers.

Double Gloxinias of Former Years

Before the surprise appearance in 1845 of gloxinia Fyfiana, the first one to have upright flowers, all gloxinias were of the nodding type. It is not surprising, therefore, that the earliest account of a double gloxinia deals with one of the so-called "slipper" or drooping varieties. Writing about it in the Journal of Horticulture, Cottage Gardener, and Country Gentleman issue of February 2, 1864, the editors, George W. Johnson and Robert Hogg, made an observation which is being echoed more or less by gloxinia growers today, as they note the fuss that is being made about double-flowering types.

> To Correspondents. Double Gloxinias. (Rev. A.F.).— we know of no reason why gloxinia flowers should not be obtained double, for other campanulate corollas are so transformed. The accompanying is the commencement of such a change, and is the portrait of one of several similar flowers exhibited before the Floral Committee of the Royal Horticultural Society. We agree with the Committee in thinking it no improvement to the flower.

A decade later, Thomas Veitch and Sons of Chelsea, in London, apparently marketed two cultivars of upright flowering double gloxinias, sometime before 1877. In his catalog for 1877, the Belgian nurseryman, Louis de Smet of Ledeberg-lez-Gand, listed 'John Gray' and 'Lady Cremorne', describing them as "double corolla."

Two years later, Louis Van Houtte in Belgium and Anthony Roozen & Sons in Overveen, near Haarlem, Holland, listed these same double-flowered gloxinia cultivars in their respective catalogs. Van Houtte's 1879 price list attributed both cultivars to Veitch and identified them as upright flowers. In describing 'Lady Cremorne', he speaks of "a new type of flower adorned with an elegant, lively rosy and white tucker inside of throat, very lively dark rose." Apparently no other nurserymen took up these novelties, either in England or on the continent, and they soon disappeared from catalogs.

All American Double Gloxinias

Both upright (Fyfiana) and nodding (Maxima type) double gloxinias were shown at the 1959 New York International Flower Show. At the 1958 show there had been two or three entries of Pullen Strain Double Gloxinias. The 1959 entries were noteworthy not only for the fact that both upright and nodding flowers were shown, but also because these double gloxinia plants had been bred in the United States by Bruce A. Thompson of Philadelphia.

The Thompson Double Gloxinia flowers are generally red or rose-colored. Some have a red limb and white corolla tube. All are completely double flowers of the "hose in hose" type that is familiar in campanulas. A Thompson Double Gloxinia flower, red with white tube, which I examined, had a six-part calyx, a six-lobed outer corolla, and a seven-part inner corolla. The outer corolla was unadorned, but the inner tube had three partly developed petals on its outer surface and four similar "tuckers" on the inside; all of them in different stages of under-development. This flower lacked a perfect style, but it had a multiplied organ composed of six fused shafts, one of them showing petal color at its tip. There were in the disk five glands of normal form plus one broad three-lobed gland of unusual form.

Mr. Thompson also has produced a double gloxinia with deep purple limb and tube of paler color. A flower of this type showed two complete corolla tubes of six lobes each, a six-parted calyx, and six glands in the disk. In addition to an apparently perfect style and stigma, there was a second "style" composed of five or six columns fused together and ending in imperfect stigmas. None of the Thompson Double Gloxinia flowers, of course, have any filaments; those organs have been developed into petalage.

Mr. Thompson, who grows his plants in the basement of an apartment building, under fluorescent lights, started with a Pullen Double Gloxinia plant. He fertilized the double flower with pollen from a Thompson Hybrid Gloxinia selected from one of the distinctive strains he had successfully developed during the past several years. Mr. Thompson is a hobbyist grower who does not sell plants or seed, but there is a possibility that one of the house plant nurseries dealing in gesneriads may offer the Thompson Double Gloxinias for public sale in the near future.

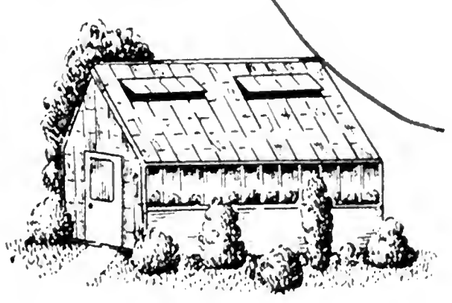
In Warsaw, New York, Henry Ten Hagen, the African violet grower, has produced a strain of double-flowering gloxinias by fertilizing a Pullen Double Gloxinia having red and white flowers by means of pollen from a blue-colored Buell Hybrid Gloxinia. People who have seen the resulting population consider them attractive. Steps are being taken to build up a sufficient stock of the Ten Hagen Double Gloxinias so that they can be offered commercially.

A REVIEW (from page 4)

place, printer, date; number of volumes; 4) title-page; 5) collation; 6) description of the Hunt Library copy; 7) published references and location of other copies; and 8) explanatory notes. Needless to say, this Catalogue is truly a mine of bibliographic information for all time.

The "Appendix" describes fifty-six important early books that have appeared as reprints or transcripts or in facsimile form since 1700. Volume I ends with an extensive bibliography of reference books; twenty-four well-selected collotype plates of illustrations and title-pages arranged in chronological order and related by number to the corresponding entry in the Catalogue; and an unusually comprehensive Index.

This reviewer would be committing a crime of omission if he did not mention the beautiful appearance of the book itself. The composition and presswork by The Anthoensen Press, on excellent, specially watermarked paper, is outstanding for its aesthetic quality and its accuracy; the binding is not only handsome but also sufficiently sturdy even for a reference book that must withstand as much use as this one will obviously receive.



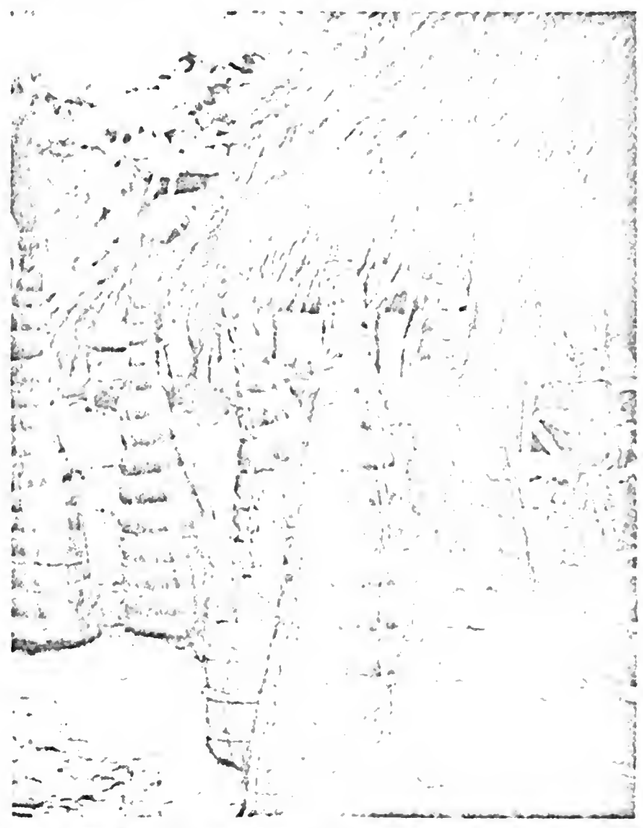
were attempting the consolidation of their respective claims to the Alto Orinoco. Yavita, an Indian chief from the Río Caquetá, came to Caño Temi about this time, ostensibly to propagandize for the Portuguese territorial and spiritual claims, but actually (according to Humboldt) to collect slaves. After being captured by the Spanish conquistador Solano, he was converted to the Spanish cause and the town named for him was established in 1756. The old chief was still alive when Humboldt and Bonpland arrived in Yavita on May 1, 1800; the portage road had been constructed only five years before.

At the time of Humboldt's arrival from San Fernando de Atabapo, Yavita had a Spanish monk in residence among one hundred and sixty Indians. (The 1959 population of Yavita was about thirty, including an outpost of the Venezuelan Guardia Nacional.) The two naturalists remained there several days while their dugout was rollered across to Pimichín; they then proceeded downstream to the Río Guainía on May 8. A welter of impressions and observations were recorded by Humboldt; at Yavita was first seen *cupana*, the source of a popular tropical drink; the botanical source of *curare* was first collected at Pimichín; *jigua*, the edible fruit of a *Caryocar*, was sampled at Pimichín; the abundance and lethal effects of the *mapanare* (fer de lance) made a deep impression on the "last of the universal men." The eighty-five curves of Caño Pimichín Humboldt rated second only to the windings of the Chagres River. While in the portage's high forest, the envy of a tropical plant collector was well expressed by Humboldt: "What we could gather appeared to us of little interest compared to what we could not reach."

Wallace's long approach to Yavita was from the Amazon and Río Negro. He arrived at Pimichín on February 1, 1851, and at Yavita on February 18. Here he remained collecting specimens (chiefly insects) until March 31. Like Humboldt, Wallace's details of a black jaguar, fish poisons, *mapanares*, and *chiquichique* are an indicative record of the shaping of a great mind. The concrete evidence of his sojourn survives only in his writings. The ship on which he and his large collections were

(Continued on page 13)

Yavita today is even smaller than in Humboldt's time.



Chiquichique palm fiber (from *Leopoldinia piassaba* Wallace ex Archer) is still an important natural product of the Guainía-Atabapo area, as it was in Wallace's time. It is exported to the United States and Europe for brooms and whisk-brooms.

The high forest along the portage is very rich in plant species.

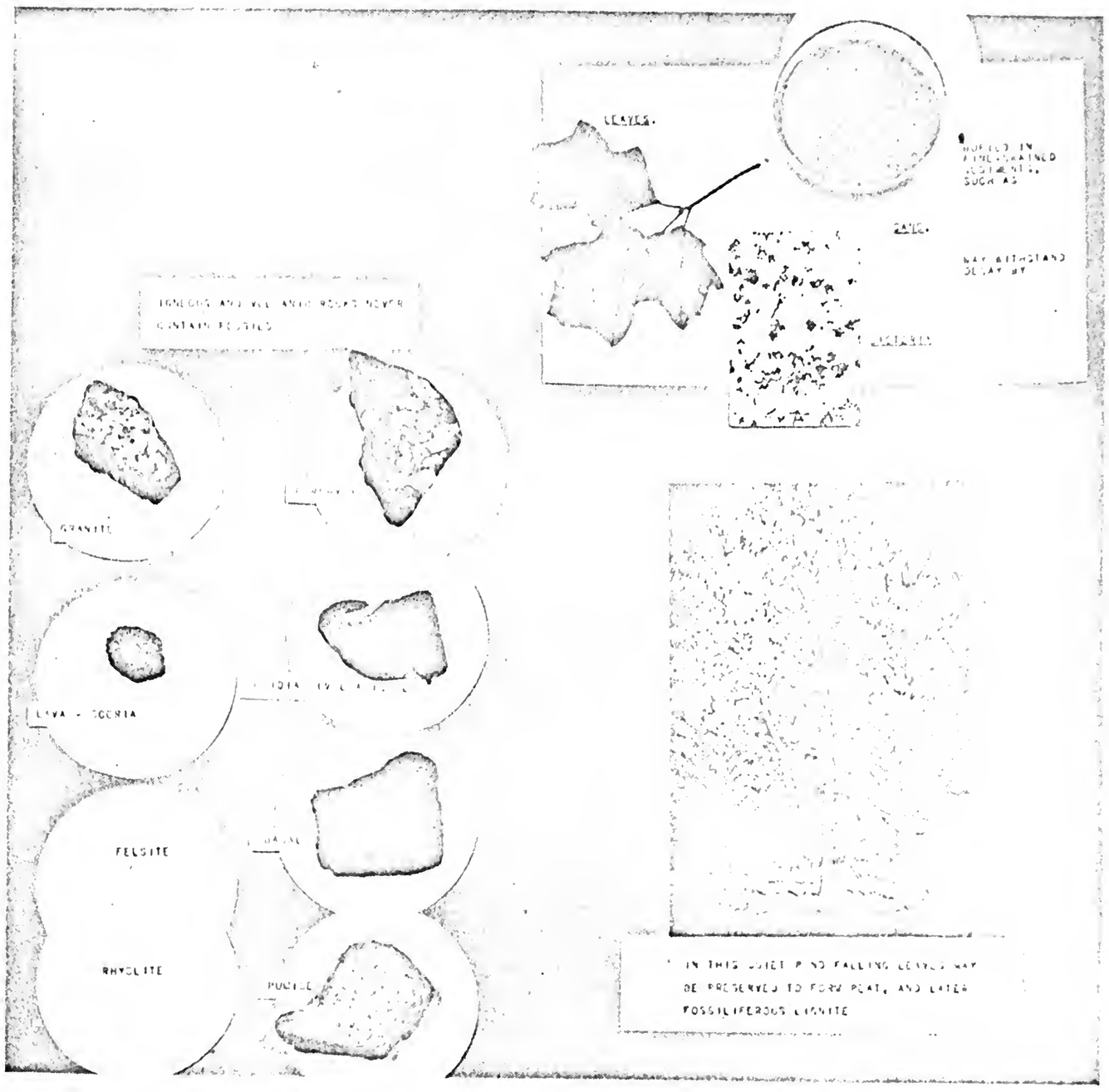
PORTAGE (from page 9)

returning to England caught afire in the Atlantic on August 6, 1852; while Wallace survived nine days adrift in a lifeboat before being picked up by another ship, all his specimens were lost.

Wallace is cruelly neglected in the plaudits of the modern scientific world. Darwin recognized a peer in the great field naturalist and said: "You are the only man I ever heard of who persistently does himself an injustice, and never demands justice. But you cannot burke yourself, however much you may try." Wallace had not only infinitely greater field experience than Darwin and opportunity for personal observation in fitting together the evidence for natural selection, but was also a person of much more diversified interests. He published tracts on economics, land nationalization, spiritualism (in the Victorian sense), and vaccination. One of his final efforts was editing the travel notes of his good friend, Richard Spruce.

Spruce was the last of a renowned nineteenth-century natural history triumvirate to visit the portage. He reached Pimichín on June 10, 1854, and proceeded to Yavita the next day. He was at the far end of his lowland travels from the mouth of the Amazon and also on the verge of the severe fever, that later incapacitated him for thirty-eight days in San Fernando de Atabapo. His written impressions were brief, despite his exultation at being in "Humboldt's country." He returned an invalid from San Fernando on August 13 and was carried across the trail in a hammock.

Recent scientific visitors to the portage have included Llewelyn Williams (1942) and a group of Venezuelan and German ecologists (1958). The New York Botanical Garden expeditions have visited the height-of-land on five different trips, most recently in June, 1959. Even twentieth-century visitors have continued to collect plants previously unknown to civilization, and all gain the impression of a benevolent rather than an inimical jungle. While it is now possible to ride across the trail in a sporadically functioning jeep, the park-like stroll is much more rewarding. All walkers echo the reflection of a Maroa doctor, long-time resident in Venezuela, that the Yavita-Pimichín portage is the most serene place he had known in the tropics.



A fossil bird, about three and a half inches long, with a prominent crest. It suggests affinity to a kinglet or titmouse. This is from the Oligocene Ruby paper shales.

difficult to provide contact time for students to study under him. The experiment stations at Illinois and Iowa State have made a concerted effort to provide for teaching and research combinations and have been quite successful in spite of the difficulties mentioned in foregoing paragraphs.

The present high level of research expenditures is primarily due to government-sponsored defense and atomic-energy research projects. In addition, some projects sponsored by industry are in fact government-supported programs that are being subcontracted to universities. If we are to continue to derive the benefits of engineering research, some means of financing must be provided in order to maintain an active research program within engineering colleges at such time as defense research funds are decreased. The National Science Foundation was conceived in order to provide support for basic research and to encourage the training of scientists and engineers. However, the funds that have been made available to this organization are still very small compared with those now being expended by the Defense Department and the Atomic Energy Commission. It is hoped that in the future additional funds will be made available to the National Science Foundation for support of research grants and graduate fellowships in proportion to the reduction of research funds that are now provided through other government organizations.

Industry is now supporting increased amounts of basic research. In addition to the specialized research program directed toward the direct solution of industrial problems, it is also providing funds for more graduate fellowships to support students interested in research training. These graduate students are in demand for research work in both industry and government. Thus, by means of research grants and fellowships, industry is making possible the training of research personnel as well as receiving the direct benefits of the research program. A greater amount of support by industry of university research is highly desirable; particularly if government support decreases.

News and Notes

Venezuelan Guayana Expedition

The New York Botanical Garden has brought to a close its 14th botanical expedition to the Guayana Highland of Venezuela, adjacent to British Guiana and Surinam. This program of exploration, begun in 1944 with expeditions to the Kaieteur Plateau in British Guiana and the Tafelberg in central Surinam (Netherlands Guiana), will come to a conclusion during the 1954–55 seasons with a second visit, in conjunction with the Chicago Natural History Museum, to Chimanta-tepuí in the Gran Sabana of southern Venezuela in the state of Bolívar, and a visit to Tepequem on the Brazilian side of the Pacaraima range, which forms the watershed boundary between southern Venezuela and northern Brazil. Support for the conduct of this program of explorations as a whole has come from many sources, but the current expedition was carried out under a grant made to the Botanical Garden by the National Science Foundation, the terms of which provide also for the forthcoming trips to the Cerros Tepequem and Chimanta-tepuí.

The expedition that has just returned was conducted by three staff members of the N. Y. Botanical Garden —Bassett Maguire, curator; John J. Wurdack, assistant curator; and George S. Bunting, assistant—who left New York on Oct. 7, 1953, and returned Mar. 4, 1954. This group explored mountains near the remote Brazilian fountier which had been seen by the previous expedition.

The objectives of the trip were two-fold: first, to make botanical collections, which might be expected to yield plants of the character and high endemism that had been previously exhibited by those from the famous Cerro Duida lying 150 mi north; and second, to make inquiry into the geology, determine the proportions, and record the positions of these new mountains.

To facilitate the exploration, the U.S. Ambassador placed the Embassy plane at the expedition's disposal. On Oct. 31, a 7-hr reconnaissance flight of some 1200 mi was made from Ciudad Bolívar across the mountainous and jungled region of southern Venezuela to the Brazilian frontier. This established without question the existence of extensive ranges along the Brazilian frontier and, further, the existence of a system of lofty sandstone plateaus northward of the frontier, well within the limits of Venezuela.

The expedition then embarked that same day at Ciudad Bolívar on the Río Orinoco. It traveled more than 1500 mi by river steamer, outboard motor, and dugout up the Orinoco, down the Casiquiare, and into its large blackwater affluent, the Pacimoni. On Dec. 13, the party reached its base camp, which was established in *guapó* forests (flooded lands) in the headwaters of the Pacimoni. Eighteen days and 5 camps later, on Dec. 31, the group arrived at the summit camp—altitude, 5500 ft—and there it remained until Jan. 23. The base camp was broken on Jan. 30, Ciudad Bolívar reached on Feb. 24, and finally New York again on Mar. 4.

The ornithological expedition of Mr. and Mrs. William H. Phelps, Jr., of Caracas joined the expedition for a period, reaching the base camp on Jan. 12. Alexander Wetmore of the Smithsonian Institution of Washington; James H. Kempton, Agricultural Attaché of the U.S. Embassy, Caracas; and Charles Reynolds, geologist of the Orinoco Mining Company,

our highly technical society. Three groups—industry, technical societies, and the government—have continued to support research programs in engineering experiment stations and other university-affiliated research organizations.

Industry, either as private companies or through its trade associations, has supported applied research in a variety of fields. Recently a number of industries, recognizing the importance of basic knowledge to their progress, through gifts and grants have supported projects of a fundamental nature.

Technical societies for many years have supported research programs in their areas of specialization. Furthermore, through their technical advisory and research committees, they have served as coordinating agencies for industry-sponsored research being conducted by universities.

The government agencies supported relatively little research prior to World War II. However, the work they did support was very productive. For example, the highway programs they have supported have increased safety and reduced costs of highway systems all over the country. During and immediately after World War II, various defense agencies and the Atomic Energy Commission sponsored a considerable amount of both basic and applied research. Often this research concerned complex problems dealing with defense systems and requiring many research workers from different disciplines. Such "team" operation brought natural and physical scientists and engineers together and provided a very satisfactory method, if not the only method, for solving complex system problems of interest to the defense effort.

This is a golden anniversary in another important sense. The application of research results from these two experiment stations alone has saved millions of dollars. Often the returns have been several hundred times the cost of the project to the sponsor. The results of research on problems related to our national defense are hard to put in terms of dollars saved, but benefits from new equipment, simplification and improvement of existing equipment, and fundamental information needed to make technological advances for the future are vital to the defense program. In these activities, universities, industry, and the government have worked together—each contributing to the over-all program. In addition to conducting comprehensive research programs, our experiment stations, as well as those of other universities, are providing training for research personnel needed to man governmental and industrial research posts.

Research, being a quest for answers to the unknown, has provided new principles of engineering and the sciences on which engineering is based. Even in applied research, where application of known principles is the primary objective, the projects provide a better understanding of fundamentals. By maintaining a close working relationship between the research and educational activities, these new principles and elaboration of known principles that are obtained through the research program provide valuable educational material. In fact, it is largely due to research conducted in engineering colleges that we can attribute our present emphasis on teaching fundamentals and the concomitant decline in student time spent on merely manipulative and descriptive techniques. Nearly all curriculums show the effects of these changed concepts; progress has been especially noticeable in such fields as mechanics, thermodynamics, electronics, and solid-state science. At the present time, the concepts derived from research in solid-state physics are being utilized in various fields such as metallurgical, ceramic, electrical, and mechanical engineering. Plans are now being formulated for the introduction of course material into the curriculums of these departments through conferences sponsored by the American Society for Engineering Education and the National Science Foundation. A similar program is being conducted to introduce the concepts of nuclear engineering to various engineering curriculums.

Technical advances through research have also intensified the need for continuing education for engineering and science graduates. Research results provide material for such adult-education programs as short courses, conferences, and seminars. Publication of research results also provides an educational medium for those who wish to keep abreast of new developments.

The complexity of modern engineering research has introduced several problems that are currently affecting the method of conducting our research programs. One of the major problems has to do with the large amount of technical material published in various fields. Today a comprehensive study of the literature covering past works in a given field of interest often requires more effort than was necessary to complete an entire project on the subject of 50 years ago. This situation has resulted in specialization of research personnel in order to minimize the time required for a survey of background material. A group of such specialists then works as a team to handle the large complex problems. In many cases, the team method of operation produces results that would not otherwise be practicable. However, this method of research is expensive and tends to inhibit individual creativeness. There is need for better support of the individual researcher through computing services, abstracting services, literature-search facilities, instrumentation services, and so forth. There is also a need for better methods of indexing material and for the communication of research results to avoid undesirable duplication of effort and wasted time and motion.

The complexity of research also introduces the problem of maintaining close relationships between teaching and research. As previously mentioned, this is desirable if education is to get maximum benefit from research. An individual research worker can divide his time between his project and teaching without undue complication. However, when he is part of a team working on a large project, it is much more

who was attached to the Botanical Garden expedition, accompanied Mr. and Mrs. Phelps.

Scientific results will be reported at a later date. It may be said, however, that the botanical findings were commensurate with early expectations. The ornithological collections have proved these mountains to have an exceedingly high ratio of endemic avifauna. The mountain itself, one of several sandstone or quartzite massifs probably exceeding 8000 feet in altitude, will be described more fully when the geologic and geographic data have been evaluated. The nomenclature of the frontier ranges and the system of sandstone table mountains will be worked out in the light of the new findings and the scanty historical data available. Richard Spruce, the pioneer South American botanical explorer, visited this area 100 yr ago and almost certainly approached at least one of the smaller sandstone mountains to its base.

BASSETT MAGUIRE

New York Botanical Garden

Science News

The following statement by the Executive Committee of the Federation of American Scientists has been released by M. Stanley Livingston, chairman.

The majority report of the Personnel Security Board which heard the Oppenheimer case bears the imprint of fair-minded men struggling unsuccessfully against the pressure of a security system extended beyond reasonable bounds. The report finds Oppenheimer to be unquestionably loyal to this country.

Evaluating the charges relating to his past associations and beliefs, the report finds that they would not in themselves affect his clearance. It finds no substantiation for the charge of overt efforts to impede or slow the H-bomb program. Nevertheless, it finds it impossible to recommend his continued clearance because of: alleged lack of enthusiasm for the H-bomb program, serious disregard of security requirements, susceptibility to influence, and "less than candid" testimony before the Board. And this despite the findings that Oppenheimer has displayed "a high degree of discretion reflecting an unusual ability to keep to himself vital secrets" and that the nation owes him "a great debt of gratitude for loyal and magnificent service." It is ironic that this service included a major role in producing many of the very secrets the security system is designed to protect.

We believe the majority findings to be unfair to Oppenheimer. But more than that, we believe them to illustrate the dangers and the bitter fruits of a security system which is now motivated more by the risks of politics than the risks of disclosure of information. The Board itself recognizes that much larger issues are involved in this case; it notes that the reopening of the Oppenheimer case is the result not of a change in Oppenheimer but of a change in security regulations and the climate of national opinion.

If it does not make sense to find risk in a man who has proven himself in the most secret councils of government—and we believe it does not on the evidence so far provided—then attention must be directed to the security system under which the case has arisen. The fault lies, at least in part, in criteria so loosely and generally drawn that they can even admit to serious consideration, in estimating security status, such fantastic assertions as "lack of enthusiasm" for official policy. The threat lies in the use of security machinery to dispense with technical consultants whose views m y no longer be acceptable to the administration in office. The danger lies in the discouragement of independent minded men, including many scientists, from lending their talents to government.

We hope that the Atomic Energy Commissioners will again review the record and, within the bounds set by law and Executive Order, do justice to Oppenheimer as an individual. But beyond that we urge strongly that the entire machinery of security must itself come under review. The American people are seeing samples of the mixing of politics and security in such highly publicized proceedings as the . . . [certain current] hearings. It is to be hoped that these hearings will attract attention to the underlying problem—the exploitation of legitimate concern for national security for political ends. Security machinery has only one justification, to protect a small area of vital national information. It cannot efficiently do more; it cannot do more without sapping our national strength and eventually destroying our traditions and practices as a free people.

It has been necessary to assume, until recently, that the rate of **oxygen consumption by photosynthetic organisms** is the same in the light as in darkness. Thus, a correction for the dark respiratory rate was applied to the "apparent" photosynthetic rate to obtain the "true" photosynthetic rate. Recently, studies on respiration rate in light have been made possible by the use of mass spectrometer analysis and heavy isotopes of oxygen [Brown, Nier, and Van Norman, *Plant Physiol.* **27**, 320 (1952); Van Norman and Brown, *Plant Physiol.* **27**, 691 (1952); Brown, *Am. J. Botany* **40**, 719 (1953)]. Through the use of oxygen 34 to label oxygen in the reaction vessel, and by following the isotope dilution, the processes could be studied simultaneously in the light: $CO_2 + 2H_2O \rightarrow (CH_2O) + O_2 + H_2O$ (photosynthesis); $(CH_2O) + O_2{}^{34} \rightarrow CO_2 + H_2O$ (respiration).

A steady decline in the concentration of $O_2{}^{34}$ was observed, owing to respiration; the disappearance occurred at a steady rate whether in the light or in the dark. Simultaneously, unlabeled oxygen released from water during photosynthesis increased in the light and decreased in the dark, owing to respiration. Thus, light was demonstrated to be without effect on the respiration of a photosynthetic organism. These methods have been applied to the study of several strains of algae and certain higher plants. From this work it is therefore demonstrated that light is without effect on the respiration of photosynthetic organisms, and thus a firm basis is supplied for the afore-mentioned correction to obtain the "true" photosynthetic rate.—W.J.N.

An Army dentist, Col. George T. Perkins of Walter Reed Army Medical Center, has invented a **new electronic thermometer,** the "Swiftem," that will give an accurate reading in 5–7 sec. It works through a carboloy thermistor at the end of a stainless steel probe.

The probe, which goes into the patient's mouth, is connected by a flexible transmission cord to a battery in a plastic handpiece small enough to fit in the palm of the hand. On the handpiece is a meter that registers the temperature. At an Army hospital, the new thermometer made it possible to take ward temperatures in one-fortieth the time formerly needed. The new device, the first change in clinical thermometers since the mercury-column type was introduced in 1867, is being manufactured by the Burlington Instrument Co. Hospital models will be on the market in 60–90 days.

The first phase of a long-range **sky-mapping program** designed to yield better insight into the true rotation of the Milky Way has been completed at the University of California's Lick Observatory. C. D. Shane, director of the observatory, and his colleague in the study, C. A. Wirtanen, observer, have reported that the last of 1246 plates has been taken, comprising a complete map of the sky as seen from the Northern Hemisphere. Each of the plates is 17 by 17 in., and required an exposure of 2 hr.

The project was conceived originally by W. H. Wright, director emeritus of the Lick Observatory, who is now living in San José. The sky map, when compared with a second one to be taken beginning some 10–12 yr hence, will provide data from which the Galactic rotation and mass can at last be accurately calculated.

Average **length of life** in the United States has reached a record high of 68½ yr, a gain of nearly 4 yr in the past decade, according to vital statistics compiled by the Public Health Service of the Department of Health, Education, and Welfare. Women on the average live longer, outliving men by 6 yr. The average lifetime expected for women at birth is 71.8 yr, while for men it is 65.9 yr. This difference in the life expectancies of men and women has increased sharply since 1900, when females outlived males by an average of only 2 yr.

White women at birth have a life expectancy of 72.6 yr, compared to 66.6 yr for white men. Nonwhite groups have a shorter average life—59.4 yr for nonwhite men, and 63.7 for nonwhite women. Although white persons outlive nonwhites by an average of 8 yr, the difference between the two groups has narrowed since 1900, when white persons lived about 15 yr longer than nonwhites.

The need for easily available steroid preparations for use as reference standards in connection with the rapidly developing paper chromatographic techniques was recognized by the Endocrinology Study Section of the Division of Research Grants, National Institutes of Health, as early as 1952. This situation was brought to the attention of the Board of Trustees of the United States Pharmacopeial Convention, and in 1953 a U.S.P. Advisory Board on **Steroid Reference Substances** was established. The membership is as follows: T. F. Gallagher, Sloan-Kettering Institute; Gregory Pincus, Worcester Foundation; Max Tishler, Merck & Co.; Adley B. Nichols, U.S.P.; and Sam R. Hall, Division of Research Grants, N.I.H. (chairman). This board is responsible for the selection of reference substances, verification of their authenticity, and determination of their suitability.

The first set of reference substances, consisting of the 24 steroids considered to be the most needed for paper chromatography, is now available. Other sets will follow, and suggestions for future additions are welcomed. Income from the sale of these substances, over and above packaging and distribution costs, will be used for expanding the program. The price is $3.00 for a single steroid and $60.00 for the complete set of 24. All inquiries concerning the Steroid Reference Substances should be directed to U.S.P. Reference Standards, 46 Park Ave., New York 16.

The Atomic Energy Commission has announced an agreement with five utility companies of the Pacific Northwest to study nuclear reactors as producers of electric power. The study is the first to be undertaken in the Northwest, where there is a growing demand for new energy sources. The project brings to 13 the **nuclear power studies** sponsored by the Commission.

In 1953, 1072, or 6 percent, of the Nation's public **water-supply systems,** were unable to meet the peak demands of their customers. About 15 out of every 100 persons using public water supplies were affected. In an attempted to discover whether the shortages were caused by drought or by a failing of man, the U.S. Geological Survey made a reconnaissance inventory of the adequacy of public water systems throughout the United States. The inventory included all 48 states, of which only Idaho, Mississippi, and Rhode Island reported no shortage. Most of the shortages were caused by municipalities outgrowing their systems. A report, "Public Water-Supply Shortages, 1953," prepared by K. A. MacKichan and J. B. Graham of the Water Utilization Section, Water Resources Division, may be obtained free from the Water Resources Review, Geological Survey, Washington 25, D.C.

S. Arend of the Royal Observatory of Belgium has discovered a minor planet that he has named "**Brunonia**" in honor of Brown University. The name was selected in recognition of the fact that the 190-yr-old Brown was one of the first institutions in America to teach astronomy. It is also a tribute by Dr. Arend to the internationally known research of Charles H. Smiley, chairman of the Brown Astronomy Department.

In a recent issue of *Frontiers,* journal of the Academy of Natural Sciences of Philadelphia, Dan Brogan describes how **beavers** are taken from regions overpopulated with the animals and parachuted from planes into inaccessible areas. There it is hoped that they will build many dams. Water storage reservoirs thus built in the mountains aid inhabited territories below.

charide contained glucose and galactose, as indicated chromatographically, with a smaller quantity of hexosamine, probably N-acetylated, since the infrared spectrum showed absorption peaks at 1644 and 1560 cm^{-1}.

The type-XIV substance, hitherto believed to contain only galactose and N-acetylglucosamine, both of which also occur in the cross-reacting blood group substances, was found to be more complex. Chromatographic and ionophoretic tests showed that glucose and glutamic acid appeared on vigorous hydrolysis. These were possibly derived from products with the mobilities of di- and oligosaccharides which were evident on milder hydrolysis. In the infrared spectrum absence of absorption around 840 cm^{-1} and the presence of a peak at 890 cm^{-1} indicated that the majority of the linkages were of the β-type.

Venezuelan Guayana—a Long-Known but Little-Understood Region

Charles B. Hitchcock,
American Geographical Society, New York

Belief by Spanish explorers and adventurers of the mid-16th century in the legend of the fabulous and gold-rich city of Manoa in the interior of Venezuelan Guiana led to a burst of interest in the region, culminating in Sir Walter Raleigh's ill-fated attempt to discover El Dorado. Major errors in the concept of the geography of the region at that time are briefly outlined. Not until Alexander von Humboldt's travels in the beginning of the 19th century was there a scientific evaluation of some of the geographic realities. During the past 20 years, the efforts of the Venezuelan Government and such individuals as the explorer, Felix Cardona, and the ornithologists, William H. Phelps and William H. Phelps, Jr., as well as the advent of air photography, have given an impetus to our understanding of the region, many parts of which still remain virtually unknown.

Cartographically it has been one of the most puzzling areas in South America. The American Geographical Society, in its program for preparing a uniform map of the Americas south of the Rio Grande on the scale of 1: 1,000,000 was thrice forced to recompile Guiana before publishing because of new and conflicting information. It prepared a reconnaissance map of 16,000 mi^2 from air photographs in New York in connection with one of Phelps' ornithological expeditions, thus providing the map from which scientific exploration of the virtually unknown could be planned beforehand.

Of particular interest are those isolated mountains rising into the subtropical zone, for there extreme endemism is exhibited by both plants and birds. The nature and origin of the mountains, remnants of a once widespread sandstone formation, is discussed briefly.

Studies on Animal Virus Reproduction

Frank L. Horsfall, Jr.,
Rockefeller Institute for Medical Research

Influenza A and B virus particles can be enumerated by determining the number of erythrocytes they cause to sediment at an increased rate. Because one infective particle can initiate reproduction in susceptible cells, the ratio of infective to total particles can be found by determining the smallest number of particles that can infect.

The number of cells lining the allantoic sac of the chick embryo has been shown to be 1.8×10^7. When less than one particle per cell of influenza A or B virus is inoculated, about 6×10^{10} new particles are produced. If all cells support virus reproduction, the yield per cell is approximately 3×10^3 particles.

With inocula of less than one particle per cell all the new particles of either virus are infective and the logarithmic rate of production is constant until the number of particles reaches about 90 per cell. Then the rate diminishes sharply with increasing time, and noninfective particles accumulate rapidly. The time to double the number of particles is 46 min with influenza A, 60 min with influenza B virus. Both viruses lose infectivity at a rapid rate. In allantoic fluid at 35°C the half-life of infective particles is 147 min for influenza A, 85 min for influenza B virus. Thus the ratios between generation time and half-life are as high as 0.31 and 0.71, respectively.

Infective or noninfective particles of either virus in amounts greater than two per cell alter the reproductive process in three ways: (i) The interval before new particles appear is increased. (ii) The logarithmic rate of production is decreased. (iii) The proportion of new particles that are infective is markedly diminished in direct relation to the initial particle-cell ratio.

In contrast, infective Newcastle disease virus has a half-life greater than 14 hr at 35°C and a generation time of 43 min. Thus the generation time-half-life ratio is less than 0.05. The yield per cell is about 1×10^3 particles. Unlike influenza, Newcastle disease virus in amounts greater than two particles per cell does not alter the reproductive process. Regardless of the particle-cell ratio, all new particles produced are infective.

Effect of Chemicals on Sporulation of Fungi

James G. Horsfall and Saul Rich,
Connecticut Agricultural Experiment Station

The process of asexual sporulation in fungi is only vaguely understood. It necessitates cell division and a new cell wall that is distinct so that the spore can be pinched off. It requires extra energy above that needed for vegetation. Sporulation is induced by an optimum energy level that varies among fungi. Metals are known to augment sporulation. The following classes of compounds generally reduced sporulation of *Monilinia fructicola* in pure culture on agar: chelating reagents, ketones, thiones, amines, phenols, hydrocarbons, and chlorinated hydrocarbons. The effect of ketones and thiones is quenched by a basic nitrogen group nearby on the molecule, and vice versa. α, β-Unsaturation of a ketone usually enhances biological activity. Here it seems to quench activity.

We suggest that chelating agents bind metals that participate in energy-giving oxidative reactions, that ketones and thiones lift the redox potential above the optimum for sporulation and the amines push the potential below the optimum, that they cancel each other when present on the same molecule, that mitosis is discouraged (i) by reaction of the ketones, thiones, amines, and phenols with the proteins of the chromosomes, and (ii) by interference with spindle-fiber formation by hydrocarbons and chlorinated hydrocarbons. We suggest further that fission of bacteria and sporulation of fungi may be biochemically related, because metal starvation, phenols, and certain amino compounds are known to retard fission of certain bacteria.

Measurement of Variability in Species of Fossil Invertebrates

John Imbrie, ***Columbia University***

The coefficient of variation (V) has been widely employed as an objective measure of variability. If samples are reasonably homogeneous with respect to age, sex, environment, stratigraphic position, and locality, this procedure is normally justified. It frequently happens, however, that individuals in a collection of fossil invertebrates vary widely in age and that criterions are lacking to distinguish age groups. In these circumstances the form of the size-frequency distribution of any linear measurement is determined primarily by geologic factors extrinsic to the organisms, and V is unrelated to biological variability. This difficulty can be largely avoided by considering pairs of logically related linear measurements and defining variability in terms of the dispersion of values about the curve of relative growth calculated by standard regression methods.

Using the standard error of estimate as a measure of absolute dispersion, a coefficient of relative dispersion analogous to V can be obtained. The use of this measure has been justified empirically by Klauber on populations of modern rattlesnakes and by the present author on populations of modern and fossil brachiopods.

Purification of Human Antidextran

Elvin A. Kabat, ***Columbia University College of Physicians and Surgeons*** **and** ***Presbyterian Hospital***

Antibody to dextran has been produced in human beings by the injection of small quantities of dextran. These antibodies, as formed in most individuals, have specific combining sites with dimensions complementary to terminal nonreducing chains averaging at least three and probably four $1 \rightarrow 6$ anhydroglucopyranose units.

Using dextran NRRL B512 containing 96 percent $1 \rightarrow 6$ and 4 percent $1 \rightarrow 3$ like units as established by periodate oxidation [J. C. Rankin and A. Jeanes, *J. Am. Chem. Soc.* **76**, 4435 (1954)], the antidextran is precipitated and washed with saline to remove extraneous serum protein, the specific precipitate is suspended in acetate buffer at *p*H 5.1 and a small quantity of dextranase from *P. funiculosum* [kindly supplied by E. J. Hehre; see H. M. Tsuchiya *et al.*, *J. Bact.* **64**, 513 (1952)] is added. On warming at 37°C for 1 hr the precipitate goes almost completely into solution as a consequence of the digestion of the dextran. The resulting oligosaccharides are dialyzed out, and a small amount of insoluble material is removed, giving the final antibody solution.

Antibody solutions contained about 90 to 95 percent of the nitrogen in the original specific precipitate, 80 to 90 per cent of which was reprecipitable by dextran. The human antidextran showed a single homogeneous boundary in the ultracentrifuge of sedimentation constant of about 7.0. Availability of purified antibody to an antigen composed of only a single sugar constituent together with the already described homologous oligosaccharides makes possible direct physiochemical measurements on the nature of oligosaccharide antibody complexes.

These studies were carried out under the William J. Matheson Commission and the Office of Naval Research [contract Nonr 266 (13)], Navy Department, Washington, D.C.

Relationship of Wound Sap to the Formation of Crown-Gall Tumor Cells

Richard M. Klein, ***New York Botanical Garden***

Tap roots of carrots differ in their ability to form crown-gall tumor cells independent of the strain of virulent crown-gall bacteria used in the quantitative assays. The tumorous alteration of the cells is a function of their cell and tissue type and of their position in the root. It is also affected by the juices expressed from the various tissue areas. This wound sap is involved in the activation or conditioning of normal plant cells and in the synthesis, by crown-gall bacteria, of a tumor-inducing principle that alters conditioned cells into incipient tumor cells. The bacterial synthesis of tumor-inducing principle has been demonstrated *in vitro*.

General Mechanisms for Enzyme Action

Daniel E. Koshland, Jr., ***Brookhaven National Laboratory***

A wide variety of enzymatic reactions that perform diverse biological functions and present apparently dissimilar chemical reactions, nevertheless, conform to the stoichiometry $BX + Y \rightarrow BY + X$. Included in this group are the phosphatases, phosphorylases, esterases, lipases, proteases, glycosidases, branching enzymes, and so forth. It is postulated that this large group of enzymes acts catalytically through a few basic mechanisms. These have been named the single-displacement mechanism, the front-side-displacement mechanism, and the double-displacement mechanism. The first two of these require that both substrates be present simultaneously on the enzyme surface, whereas the latter allows a primary electron-sharing attack by the enzyme on one substrate (BX) even in the absence of the second substrate. The fundamental characteristic of all of these mechanisms is that they proceed by steps in which a single bond is broken as a single bond is formed in direct analogy to the well-known displacement mechanisms of organic chemistry.

With these assumptions it is possible to explain many observed phenomena such as the stereochemistry of the enzymatic reactions, the correlation of bond breaking with specificity, the occurrence or absence of exchange between BX and radioactive X, the simultaneous transferase and hydrolytic properties of some enzymes, and a rough explanation of the *p*H dependence of enzymatic activity. Specific illustrations have been obtained with 5′ nucleotidase, beta-glucosidase, acetylcholinesterase, invertase, the phosphorylases, and glutamine synthetase.

Research carried out under the auspices of the U.S. Atomic Energy Commission.

Effect of Some Iron Complexes on Hydrogenase

Alvin Krasna and David Rittenberg,
Columbia University College of Physicians and Surgeons

We have previously shown that the enzyme hydrogenase is inhibited by very low concentrations of nitric oxide [*Proc. Natl. Acad. Sci.* **40**, 225 (1954)]. In a search for other inhibitors, we have tested the effect of nitroprusside and several other pentacyano and hexacyano iron complexes on the hydrogenase of *Proteus vulgaris*. The enzyme activity was measured by determining its catalytic effect on the rate either of the orthopara hydrogen conversion or of the exchange reaction between HDO and H_2

[*J. Am. Chem. Soc.* **76**, 3015 (1954)]. The following ions at a concentration of 10^{-3} molar had no inhibitory effect; ferrous, ferric, ferricyanide and ferrocyanide. Six pentacyano iron compounds, tested at 10^{-3} molar concentration inhibited hydrogenase about 50 percent. In a particular compound, nitroprusside inhibits 69 percent at $10^{-4}M$, 56 percent at $10^{-3}M$, and 46 percent at $10^{-2}M$.

During the experiments in which nitroprusside was tested for its inhibitory effect, it was observed that the solution of nitroprusside changed from its original faint orange to blue-green and finally to a yellowish-brown. Quantitative determinations show that 1 mole of hydrogen was consumed per mole of nitroprusside.

The blue compound formed after partial reduction is bleached by air to yield a compound other than nitroprusside. Nitroprusside is not reduced by hydrogen activated by platinum.

Uranium-Lead Method of Age Determination

J. Laurence Kulp, ***Columbia Unviersity***

The absolute geologic time scale has been inferred from age measurements by the uranium-lead method. New investigations have elucidated the factors that produce anomalies among the various isotopic ratios that are used for the age measurement in this method, that is

$$\frac{Pb^{206}}{U^{238}}, \frac{Pb^{206}}{Pb^{210}}, \frac{Pb^{207}}{U^{235}}, \frac{Pb^{207}}{Pb^{206}}, \text{and } \frac{Pb^{208}}{Th^{232}}.$$

Correction for common lead contamination is improved if the isotopic composition of the common lead of a district is known. Radon leakage occurs in all radioactive minerals, but this phenomenon can be measured and its effect calculated. Leaching of lead in preference to uranium also appears to occur under certain conditions. The agreement in the isotopic and chemical assays from various laboratories suggests that the analytic procedures are not a significant source of error.

An attempt is made to illustrate each of these effects with new data, to show which age determinations can be accepted with a high degree of confidence, and to propose the experimental program required to fill out the geologic calendar.

Velocity Distribution Measurements in Atomic and Molecular Beams

P. Kusch and R. C. Miller, ***Columbia Unviersity***

A high-resolution spiral rotor velocity selector has been built for study of the velocity distribution of the particles in atomic and molecular beams. For atoms effluent from an oven with slits designed to approximate as nearly as possible an ideal aperture of infinitesimal thickness, it is found that the velocity distribution is that to be expected from a Maxwellian velocity distribution within the oven. In the case of the alkali halides the velocity distribution indicates the presence of polymers of the diatomic molecule. The polymers are principally dimers and are an important component of the lithium halides. They decrease in abundance, under our experimental conditions, with increasing atomic number of the alkali and are unobservable for the cesium halides. An observation of the abundance of the dimers as the temperature and pressure of the gas in the oven are varied yields the heat of dissociation of the dimeric molecule into two monomeric molecules.

Rate of Evaporation of Water through Monolayers of Fatty Acids

Victor K. LaMer and Robert J. Archer,
Columbia Unviersity

The control of evaporation from reservoirs is a problem of economic importance. The influence of monolayers has been investigated by measuring the rate of absorption of water vapor by a desiccant surface 2 mm above the water surface. The rate of evaporation is reduced by a factor of 10^4 by these monolayers. The data are reported as specific resistances of the monolayers to evaporation for the saturated fatty acids, C_{17}, C_{18}, C_{19}, and C_{20}. They were measured as a function of surface pressure, chain length, monolayer phase, subphase composition, and temperature.

For a liquid condensed phase, the logarithm of the resistance of a monolayer is independent of the surface pressure and *p*H of the subphase but is a linear function of the chain length and the reciprocal of absolute temperature, which substantiates the description in terms of an exponential energy barrier.

A theory is proposed for the source of the energy barrier; calculation of its magnitude agrees well with known data on heats of vaporization. A full discussion will appear in the *Journal of Physical Chemistry*.

Temporal and Intensity Limits of the Flicker-Fusion Threshold

Carney Landis, ***Columbia University***

When the eye is stimulated by intermittent light, any of several sensory experiences may result. The experience of flicker may change to fusion, or vice versa; that is, a critical flicker-fusion threshold (CFF) may be established. The basic considerations are successive pulses of light having measurable duration; the pulses are separated by measurable intervals of reduced light or absence of light. In most experiments the duration of the light pulse and darker interval bear some regular relationship to each other, which usually has been expressed as a light-dark ratio. It is of interest to consider the boundaries in time and luminance within which the CFF has been found to occur. The luminance limits are approximately -6.67 log millilamberts to 5.5 log millilamberts. The pulse duration limits extend from 8×10^{-3} to 2.5×10^5 μ sec. The darker interval duration limits extend from 0.6 to 2.5×10^5 μ sec. A three-dimensional graphic representaion of these boundaries which gives rise to a "solid" is shown. Within these boundaries the interaction of the effects of the ten or more known determinants of the CFF may be systematically located and their effect on the temporal and luminance components may be apportioned.

Model for Multiple Meson Production

T. D. Lee, ***Columbia University***

A Bloch-Nordsieck type treatment of multiple meson production is presented. In this treatment the physical nucleon is regarded as a composite system composed of a core surrounded by a meson cloud. The collision of two nucleons is assumed to consist of a sudden exchange of spin, isotopic spin, and momentum between the cores of these two nucleons; these, in turn, shake off part of the surrounding mesons as radiation. This treatment is applied to both the symmetrical scalar meson theory and the neutral pseudoscalar theory for arbitrary values of the coupling constant.

Vitamin B_{12}, Rhizobia, and Leguminous Plants

Alfred P. Levin, Helen B. Funk, Moses D. Tendler,
Barnard College* and *Columbia University

Assays of *in vitro* cultures of root-nodule bacteria with *Euglena gracilis* var. *bacillaris* and with *Ochromonas malhamensis* confirmed that *Rhizobium meliloti, R. trifolii,* and *R. leguminosarum* synthesize vitamin B_{12}, as had been shown previously. Additional studies showed that the ratio of the amount of the vitamin excreted to that retained with the cells of *R. meliloti* was at least 1:2; of *R. trifolii,* at least 3:1; and of *R. leguminosarum,* at least 1:1.

Assays of the pink (leghemoglobin-bearing) root nodules of alfalfa, clover, and pea plants revealed the concentration of vitamin B_{12} to be 3 to 34 times greater than that in the root tissues. In the case of alfalfa, the concentration of the vitamin in pink nodules was 400 percent greater than in white nodules.

Rhizobia isolated from pink nodules gave a different ratio of vitamin excreted to retained as compared with those for the bacterial cells grown *in vitro*. The *in vivo* ratios were for *R. meliloti,* 14:1, and for *R. trifolii,* 5:1. There was also an increase in the number of molecules of vitamin B_{12} synthesized per bacterial cell in the nodules, this being especially marked for *R. trifolii.*

Alternate Modes of Pion and Muon Decay and of Muon Capture

S. Lokanathan, J. Steinberger, H. Wolfe,
Columbia University

We have searched for the following three processes:

$$1)\ \pi^+ \longrightarrow e^+ + \nu$$
$$2)\ \mu^+ \longrightarrow e^+ + \gamma$$
$$3)\ \mu^- + \mathrm{Cd} \longrightarrow \mathrm{Cd}^* + e^-$$

The apparatus employed electronic counting techniques and was of considerably greater sensitivity than has previously been used for this purpose. Nevertheless, we have found no evidence for the existence of these reactions and find

1) Rate $(\pi^+ \longrightarrow e^+ + \nu)$/rate $(\pi^+ \longrightarrow \mu^+ + \nu) < 5 \times 10^{-5}$
2) Rate $(\mu^+ \longrightarrow e^+ + \gamma)$/rate $(\mu^+ \longrightarrow e^+ + 2\nu) < 2 \times 10^{-5}$
3) Rate $(\mu^- + \mathrm{Cd} \longrightarrow \mathrm{Cd}^* + e^-)$/rate $(\mu^- + \mathrm{Cd} \longrightarrow \mathrm{Ag}^* + \nu) < 3 \times 10^{-3}$.

Present theory does not seem to provide an understanding of the smallness of these interactions compared with those that are actually observed.

Cytochemistry of the Human Ovary

Margaret E. Long and Earl T. Engle,
Columbia University College of Physicians and Surgeons

Ovarian histophysiological studies have long centered their interest on the identification of the cells that secrete ovarian hormones or related substances. Most of the enlightenment on this subject has been obtained from studies of animal ovaries. This paper presents a cytochemical analysis of preovulatory follicles in sections of resected human ovaries.

Since ovarian hormones are fat-soluble steroids, lipid tests were correlated to identify the types of lipid and their distribution throughout normal follicular development and atresia. Reactive lipid substances, mainly cholesterol, were visualized in theca interna cells of healthy preovulatory follicles. The granulosa of normal follicles contained no lipid. Nonspecific lipid was first localized in theca cells of preantrum-stage follicles; cholesterol in the succeeding early antrum stage. Granulosa lipid, acidic or phospholipid in nature, appeared in atretic follicles of all types. The theca interna then, presumably, is the site of the production of ovarian hormones or of precursor substances.

Using the PAS technique, glycoprotein was inferred as a component of the follicular fluid, the zona pellucida, and the basement membrane. The zona pellucida was thus demonstrated as a thin membrane in the primary follicle. The earliest manifestation of the secretion of follicular fluid was in the four-layered follicle.

Botanical Exploration of the Guyana Highland

Bassett Maguire and David D. Keck,
New York Botanical Garden

For 250 years naturalists have been lured to the Guyana Highland of northeastern South America by the great riches of plant and animal life that are to be found there. The sandstone table mountains that form the characteristic topographic feature of the region bear on their summits a flora that contains the highest incidence of endemism known from any part of the globe of like area. The Guyana Highland extends from near the Colombian boundary across southern Venezuela and British Guiana to Surinam.

The New York Botanical Garden has been actively exploring this region since 1944. Sixteen expeditions have been made by the Garden thus far, with four more now in progress. Some 18,000 numbers of plant collections have been made in sets of 6 to 10 each and by the end of the current season, which draws this exploratory phase of the Garden's work in the Guyana Highland to a close, aproximately 150,000 specimens will have been taken. It is estimated that the area in all contains some 4000 to 5000 endemic species and 100 new genera, large numbers of which are as yet undescribed.

Changes in Three-Dimensional Shapes of Cells, within the Apical Meristem, during Cell Division

Edwin B. Matzke, *Columbia University*

Cells in tissues have some features in common with the units of certain inorganic systems; they differ, however, in their origin from preexisting cells. In the present study, 400 interphase cells and 400 dividing cells were investigated. Median sections of the stem tip of *Anacharis densa* cut at 40 μ and stained in Feulgen and ruthenium red were used, and the cells were examined, in toto, under oil immersion.

The 400 interphase cells had an average of 13.9 ± 0.1 faces, the range being from 9 to 21. There were 101 cells with 14 faces; 13- and 15-faceted cells were also abundant. Hexagonal, pentagonal, and quadrilateral faces were most frequent. These 400 cells occurred in 96 combinations of faces; 38 cells had 4 quadrilateral, 4 pentagonal, and 6 hexagonal faces—the commonest combination—while four had 6 quadrilateral and 8 hexagonal faces, as in Kelvin's tetrakaidecahedra.

The 400 dividing cells averaged 16.8 ± 0.1 faces, the range extending from 13 to 22. In these cells there were 170 combinations of faces, and pentagonal faces were the most numerous. Cells in early prophase had an average of 16.4 ± 0.2 faces; in late prophase, of 16.7 ± 0.3 faces:

TRIO PARIMONI

Venezuela
Brazil (1964)

Temeubo

Sallo Hua

Río Ventuari

Río Cunucunuma

Río Manapiare

Río Orinoco

Río Casiquiare

Río Negro

Río Guainía

Río Tuamini

Río Pasimoni

Río Baria

Río Yatua

Río Cuao

Río Sipapo

Río Autana

Río Temi

Río Tuamini

Río Isana

Río Aiary

Río Querari

Río Içana

Río Aiarí

Río Uaupés

Río Tiquié

Río Papurí

Río Vaupés

Río Apaporis

Río Caquetá

Río Putumayo

Río Içá

Río Japurá

Río Solimões

Río Negro

Río Amazonas

Río Madeira

Río Purus

Río Juruá

Río Tefé

Río Coari

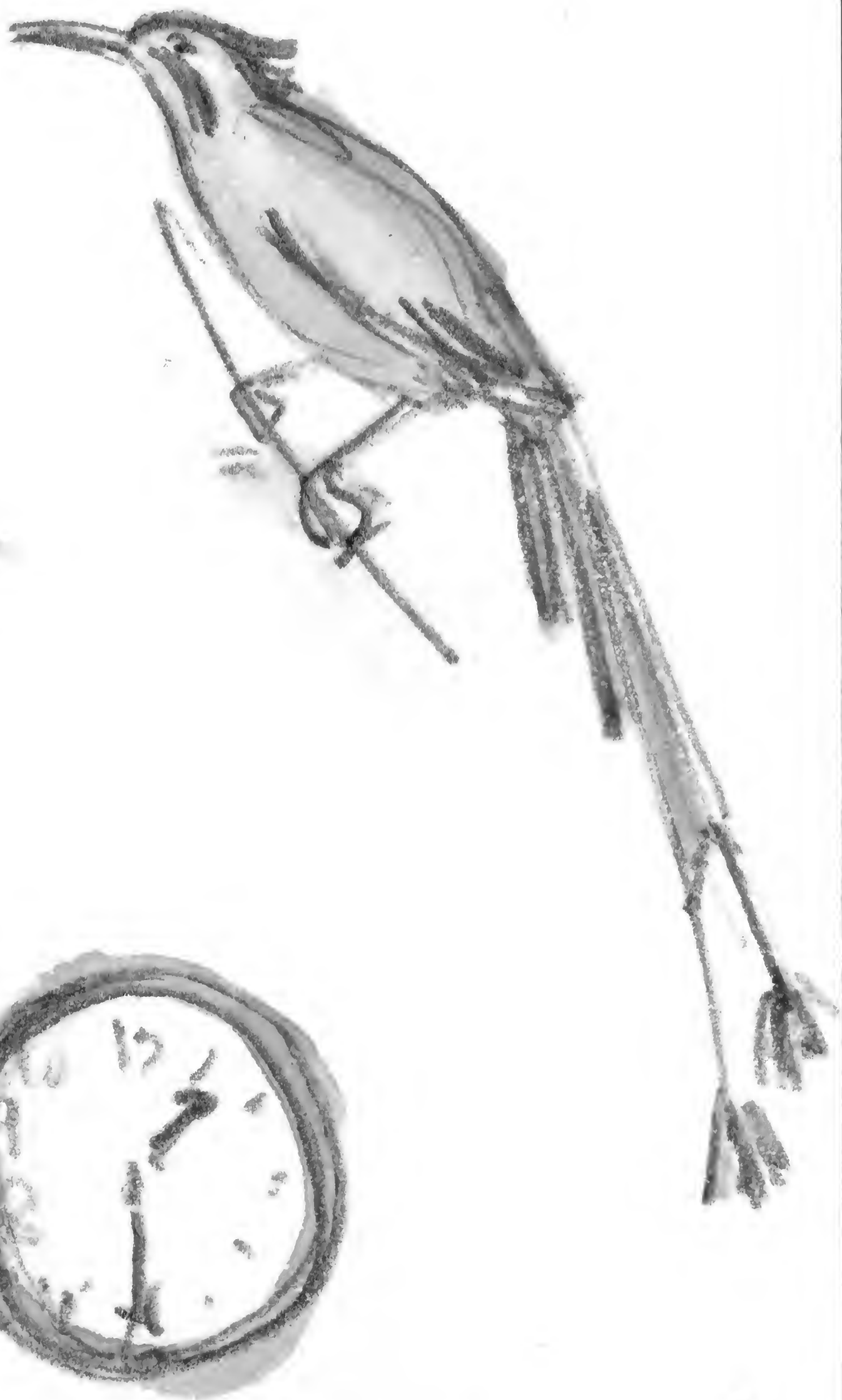
Río Manacapuru

Río Jutaí

Río Urucu

Río Negro

Río Solimões



"Motmot time!"

CARACAS
U.I.P.N.

To Kellogg 8/5/54

During January and the early part of February Alexander Wetmore was the guest of Mr. and Mrs. William H. Phelps, Jr., of Caracas, Venezuela, on an expedition in the Territory of Amazonas, southern Venezuela. The party, which included the geologists Dr. Guillermo Zuloaga of the Creole Petroleum Company and Dr. C. D. Reynolds of the Orinoco Mining Company, and Dr. James H. Kempton, Agricultural Attaché at the American Embassy, left Caracas on the morning of January 2 by Catalina amphibian plane, and flew to Esmeralda on the Upper Orinoco. Landing was made on the savanna and the party, transferring to two launches (falcas), proceeded to the head of the Caño Casiquiare, the stream that, taking about one-third of the water from the Orinoco at this point ~~and~~ flows southward, augmented by several major tributaries, to join the Río Guainía, and form the Río Negro. one of the principal affluents of the Amazon, thus connecting the two great river systems of northern South America. On January 5 the party entered the Río Pacimoni from the Casiquiare and three days later came into a branch of this stream known as the Río Yatúa. Presently the forest closed in as the stream narrowed and it was necessary to transfer to canoes (curiaras) and so to continue through channels that wound through areas where the stream banks were flooded.

A party of botanists under Dr. Bassett Maguire of the New York Botanical Garden had preceded, but in spite of this much time was lost in cutting through fallen trees, and in locating the proper channels. A base camp at the head of navigation was reached on January 15, and Wetmore and Kempton remained here for work in the lowland forest while the rest of the party continued with porters to join the botanists on Cerro de la Neblina, a 7000 foot mountain hitherto unknown, near the Brazilian frontier. January

25, the mountain party having returned, the expedition moved down river, continued south to San Carlos de Río Negro, and from there back up the Río Guainía to Maroa and Victorino on the frontier with Colombia. On February 6 they crossed the 18 kilometer foot trail from Pimichín on the Amazon drainage to Yavita on the Río Temi, which flows into the Atabapo, a tributary of the Orinoco. At Yavita a falca was waiting, and the down-stream journey began, ending finally at Puerto Ayacucho, capital of Amazonas. On February 11 the group again reached Caracas, returning by air.

Dr. Wetmore had opportunity through the journey to study the northern edge of the great Amazonian forest, and to make collections of birds, not only at the base camp, but also in Colombian territory along the river boundaries.

Via Airmail

Balboa, C.Z.
February 20, 1954

United States Despatch Agent
45 Broadway
New York, New York

Dear Sir:

I enclose herewith original bill of lading covering shipment of five pieces of field equipment addressed to the Smithsonian Institution, U.S. National Museum, Washington, D.C. in your care.

The equipment concerned in this shipment is from an expedition into southern Venezuela that I have just concluded and that I shipped from Curaçao, Netherlands Antilles, at the conclusion of the work. It is scheduled to go forward on February 22 on the SS. SARPEDON of the Royal Netherlands Steamship Company, in the locker, and not in the hold, of the ship. I will greatly appreciate it if the cases in question may go forward to Washington promptly by truck. I am writing to Miss Weiss at the National Museum in Washington, informing her of this shipment and sending her a copy of the bill of lading and of this letter.

Sincerely yours,

A. Wetmore
Research Associate

Enclosure
cc. Miss Weiss

Curaçao, Feb. 15

✓ ship field outfit
✓ Bank - cash check, exchange bolivares
✓ Hansen sitar
✓ china closet
✓ airplane tickets
✓ visit bird collection
✓ taxi for airport
✓ laundry to be packed
✓ settle affairs with Elaine
✓ perfume for Louis

China closet
size 48 x 22 x 18
iron bound corners

Baggage Curaçao 2/16

7 suitcases
1 typewriter
2 kitbags
1 duffle bag
1 brown bag
1 bundle canoe paddles
1 coat

1 pr. field glasses

(15)

2/9

Atteora melandura de la Castellete.

Sr. Don Eloy Tejarado, Marca
Dr. d. m.
Dr. Guzmán Guevara
Gobernador, Puerto Ayacucho

Baggage, Caracas. 2/13
Foot locker
collecting chest
2 fiber cases (small)
1 " " (large)
Bedroll
2 suitcases
brown bag
canteen
field glasses
camera
12 1 zippered bag

Brackman PA. 31771
Bill Violetta

Miss Virginia McLean
Miss Celeste E. Meininger
Mrs. Sue Pappas

Merlin 4-1155
Mamaroneck 9-2544
230 Melbourne St.

Norman Mason
c/o Grace Line
Hanover Square, N.Y.

Dec. 28, 2 p.m. to Maracay
29 2nd Maracay, Rancho Grande Caracas
30. Wed yacht! Dinner Kathy
31. 2 hrs.

Dinner Kempton

Jan 1!
Jan. 2 - 30 Esmeralda

✓ Send
Espinosa volume to
S.g.c. Zeppenfeldt
Hoogstraat 14, Curaçao, N.A.
(Spanish)

Get 3 books by Madariaga
on Rise of Spanish empire
Fall " "
Life of Simón Bolívar

Dr. F. H. Amsing
C/o C P d. M.
Curaçao
(has collection of books)

W. H. Phillips: Primitives

W. H. Phillips has not send Bentz Wanderungen. send him one.

C. D. Reynolds address
c/o Orinoco Mining Co.
Aparado 3
Ciudad Bolivar
Ven.

+ Geographic Gazetteer. wants list of available maps and publications.

---

write to
Sr. Don Eloy Tejeiro, Jefe Civil
Maroa, Terr. Amazonas
Dr. J. M. Guzman Guevara
Gobernador, Terr. Amazonas
Puerto Ayacucho.

---

order from Vienna
Otto Koenig - Weg ins Schilf:
Erlebnisse mit Tieren. 1949
Publ. Ullstein Verlag, Wien
Printed by Christoph Reisser's Sohne

Purchases

2 baskets, 1 fan Bs/2.50 · (Manoa)	3.65
1 basket (gift) San Carlos	1.00
1 hand bag	16.75
2 handkerchiefs	1.50
3 pocketbooks.	6.75
2 canoe paddles	1.80
2 bateas	1.00
1 gold chain	35.00
2 silver ornaments (fish)	2.50
1 gold-plated " "	1.95
1 gold pin	20.95
1 gold figurine	4800

Baggage to Curaçao

1 Hold
1 Foot locker
1 Collecting chest
3 small telescopes
1 large telescope
1 Bedroll
1 Suit case - rejected.

Ricardo Muñoz Tébar
Los Caracas
Stock of newspapers
magazines
flit gun
flit.

12/19 Lat. 26°26'
Long. 70° 14'

Jacquetta Hawkes

Take to Panamá from Curaçao
Bed roll
2 pillow cases
Gun
Sold ox forks

Bungin Curaçao
Chlorodine - Brownis
Ship baggage.
watch

Balboa - Panama City
giant clam Tridacna gigas Ls.
from Bikini Island.

Buy the following:
2 bath towels. laundry soap.
dish towels (tea towels)
flit gun
fly

Latin American Committee
meets, N.Y. Office May 19.
Breakfast with Army Lt
Century 8:00
meeting 9:30

Capt. Gerald Nolan
Oscar Hunger
Mr. Underhill
Ike Moe
Quinn. Cook
Lopez
Mrs. Haseler

Marcona 2/1

1 Shirt (gun
1 trousers
1 shorts
1 undershirt
1 towel
1 red handkerchief
1 khaki "
1 pajamas
1 pr. Sox

Baggage checked Puerto Ayacucho
2 folding cases
1 packing case
1 Haversack
2 small duffle bags
1 large " "
1 pkg 2 canalitos

By hand
1 camera bag Curripaco
1 duffle bag

8/30.
36

1/4 Cuyaliana - Espinosa
Waptrus ater. Blue-winged teal
Corcorhinus Fulco albigularis
Mucorhynchus
1/5 Espinosa -
dctinia plumbea
SK Raudal Cobarua
Catara - ají - Paiqe vulcanet hub
Siapa - white water bat broun
steam Caseyquian
1/12 Katipan -
attain. Mexim. Ramphastos tucanus white throat
Ochthornis Coaemorhinus //.
Cerebio Spotted Sandpiper
Mecembrinibis Chul. d. Opistua
Dopterus amer. Anhinga
Toucans Typ. melancholicus
Strelpstopmorn Cathartes burr.
Mitey tormentosa - about 4, curved inj down on
one wing 1. vertigo on other. Trachea comes
down right side of breast parallel to crista
nearly to end then loops back. one on each wing
other TAIEEATRK
purpose ATNRKD
3 dorsal

1/2 Esmeralda - Cano Caripo

Tyrannus elatus	Tyrannus melancho.
Legatus leucophaius	Erasemia
Arida cocoi	Pelecanus occidentalis
Attila fasciatus	Phyllostrops
Ondatra zibethicus albicula	Spotted sandpiper
Casmerodius	C. egret
Coragyps Tinamus	Phaethusa

1/3 Caño Caripo - Capybara

Megarhynchus	Crotophaga major
✓ Casmerodius	Megaceryle torquata
Pelecanus	Chloroceryle amazona
Attila	Cacicus vitellinus
Tyr. melancholicus	nest over water
Anhinga	Butorides striatus
Phaethusa	Tityra inquisitor
Cocoi heron	Ictaetus
Colonia colonus	Buteo magnirostris
Calhartes aura	Hapaloxyptenus
Sterna superciliaris	Spotted Sandpiper
✓ osprey	King vulture
yellow-headed vulture	and cormorants
Pitangus lictor	Anas discors

- Duffle-bag (new)
  flannel shirt
  hunting coat
  rope
  flashlight batteries
  " bulbs
  plastic gun case
  Compass
  felt sole shoes
  old oxfords
  sleeveless hunting coat
  qal. canteen
  qt. "
  toilet paper
  Small kit kit
  1 gun oil (open)

duffle bag (old)
2 lbs combread
halazon
3 cakes soap
~~blk~~ poncho
5 insect repellent
1 gun oil
pulpy
Shoe grease
antibiotic
1 shirt - 1 drish
1 pillow case
1 towel - gym bag
1 laundry bag
mothballs
band aid
1 aralen
bandages
1 spool # 40 thread
bathing trunks.

Zippper bags.

Passport - papers
film
2 film bags.
Explosives underplay
clothing
enema bag
1 empty canvas bag

extra strong boots
pocket knife
spare 32 ammo
Sewing Kit
extra spectacles
Sunglasses
twine

9/2/54

Lv. 6:30 a.m.

W.H. Phillips.

" " Jr.

Kathy

Guillermo Zuloaga

Dalmo K.S. Dallmas

Patterson (geol. Texaco)

J./T. Kempton

A.W.

Reynolds.

Pilot Capt. Malone, Buth g.

Co-pilot Bert E. Campbell

Flight Eng. Robt Otteken

Taguigny Aragua 12/29

Pied-billed Grebe

Least "

Cormorant

Anhinga

Wh-bloody ibis

Blk-crowned Night Heron

Yellow " " "

Louisiana Heron

Little Blue "

Great " "

Cocoi Heron

Butorides striatus

" virescens

Cattle Egret

Snowy Heron

Egret

der neu bestimmten Grenze

zwischen

BRASILIEN UND VENEZUELA

nach den Aufnahmen der

brasilianischen Grenzcommission.

Maafstab 1 : 2,000,000.

10 5 0 10 20 30 40 50 60 70 80 90 100

Kilometer.

Erklärungen.

Ig: Igarapé (Bach)

Cach: Cachoeira *(Stromschnelle)*

⚓ *Anfang der Schiffbarkeit.*

Varadouro: *trockener Ort, wohin die Kähne im Winter gezogen werden.*

● **Povoação** *(Dorf)*

○ *Arraial (Weiler)*

▲ *Sitio oder Maloca (Ansiedlung)*

1 *Grenzsteine.*

——— *Landrouten der Expedition.*

BRASILIEN

VENEZUELA

Serro Mashiaty

Mashiary

R. Baruma

Serro Mereuar

Serro Putunary

Rio Auar

Victorino

Maroa

Guzman Blanco

S. Miguel

Itamo

Democracia

Viçre

Ste Anna

Guayanachi

S. Antonio

Nazareth

Tiriquim

Serro de Camaguine

Sº Guachupiro

Solano

Curinacari Fels *(mit Petroglyphen)*

Buena Vista

Sº Orure

S. Felippe

S. Carlos

Fort

Bruno

Serro Amanadona

Sta Rosa (Amanadona)

Esteraõ

Rio Iatua (Schwarzes Wasser [langsam])

Pedra do Cucuhy Oesterr. Militär posten

Cucuhy (Preußischer Militär posten)

I. Caebaca

Marabitanas

S. Marcellino

Rio Xié

Rio Issana

N. Senhora da Gloria

S. Felippe

R. Uaupés

S. Gabriel

Serro do Barão Cabo Frio

Ehemaliges Detachement

Rio Maia

Sº do Cabary

Sº do Tunary

Sº do Abio

Serro Guai

Sº Tamaquary

Serra Tapiira

Sº Maroori

Sº Curuiba

Sº Roldurio

Sº Tamaquary

Castanheiro

Sº do Castanheiro

Sta Isabel Nova

Serro Menilada

Sº do Jacamin

Boa Vista

Pirapucú

Serra Onory

Dimitry (120m hr)

Rio Cauaburi

Rio Issana

Rio Maraua

Rio Daraha

Rio Negro

Canal Marchiori

Bifurcation

Wasserfall Ruth

Trinidad

S. Jose

S. Pedro

Curicuriary

Arapucuy

Aruti

Yauaraca

Mandi

Yaracaca

R. Baltina

Serra

Rio Iá

Rio Mahé

Rio Içana

Rio Aiary

Rio Marié

Rio Curicuriary

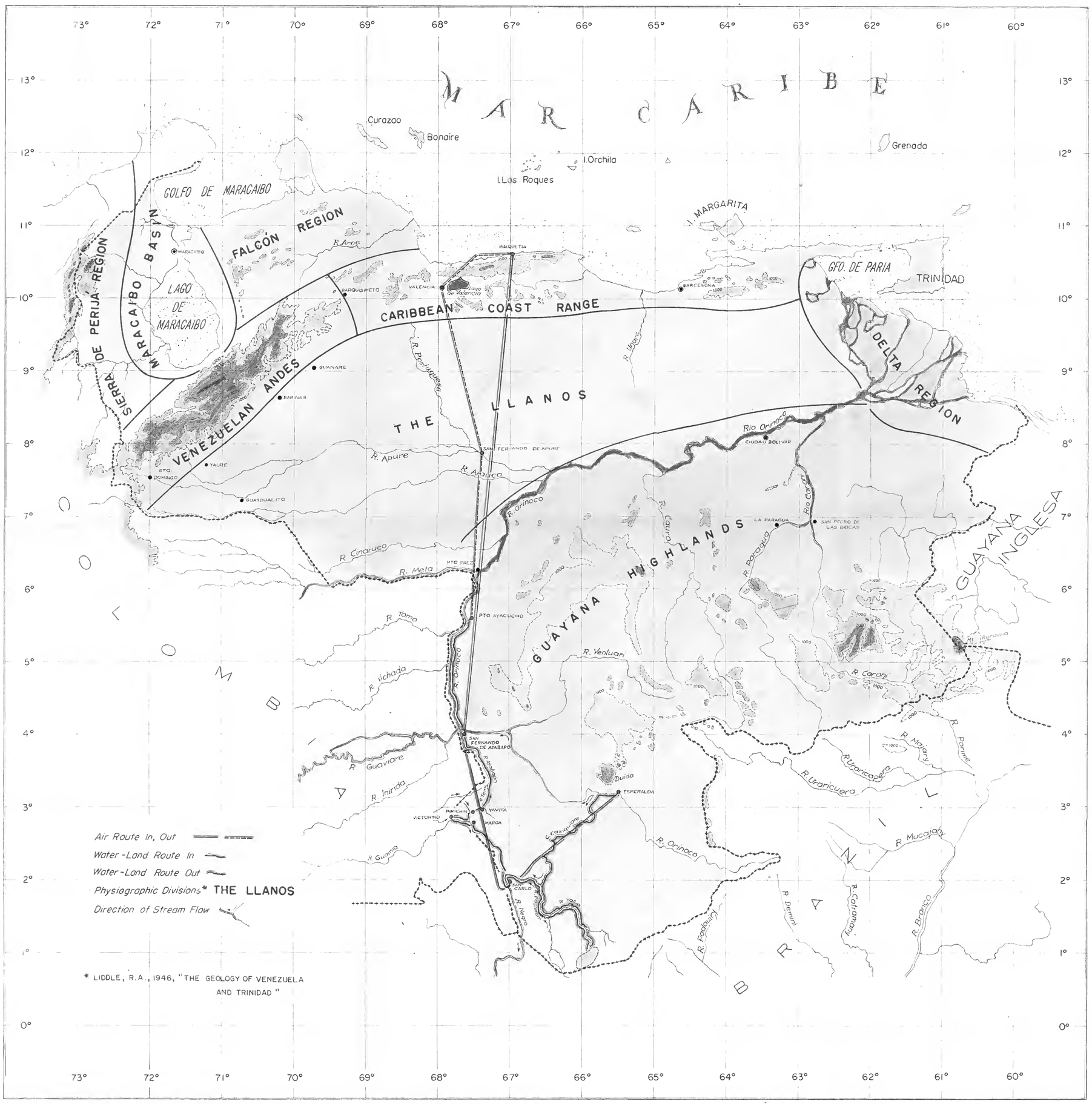
Rio Xié

Rio Uaupés

Rio Negro

Rio Issana

SAN FERNANDO DE ATABAPO
Feb 8
SANTA BARBARA DE ORINOCO
426 33
Piedra Aguira
Feb 7
Feb 6
Feb 5
Feb 2-3
Feb 4
Jan 3
Jan 4
Jan 5
Jan 6
Jan 7
Jan 8
Jan 9
Jan 10
Jan 11
Jan 12
Jan 13
Jan 14
Jan 15
Jan 16
Jan 17
Jan 18
Jan 19
Jan 20
Jan 21
Jan 22
Jan 23
Jan 24
Jan 25
Jan 26
Jan 27
Jan 28
Jan 29
Jan 30
Jan 31
Jan 1
Jan 2
CERRO DUIDA
7861
CERRO MARAHUACA
CERRO YAPACANA
4101
CERRO HUACHAMACARI
5630
CERRO ARAUCARIA
CERRO IDAPA
CERRO MAUTITUL
CERRO VUIVA
CERRO ARISPA
(CERRO TIBIALI)
SIERRA PARIMA
SIERRA DE CUMUTINA
SIERRA PIRAPUCU
SIERRA CUCUITA
AMAZONAS BRAZIL
VENEZUELA
COLOMBIA
ABRUPT CLIFFS REPORTED IN THIS AREA HAZARDOUS FLYING UNDER 13000 FEET
Río Orinoco
Río Ventuari
Río Guaviare
Río Atabapo
Río Negro
Río Casiquiare
Río Mavaca
Río Padamo
Río Siapa
Río Manaviche
Río Autana
Río Cunucunuma
Río Ocamo
Río Mavaca
Río Toma
Río Guaitinia
Río Cocuy
Río Xie
Río Matacuni
Río Baltazar
Río Caura
Río Caroni
Río Icabaru
Río Aro
Río Paragua
Río Yuruani
Río Yuruaní
Río Yuruaní
Río Yuruaní

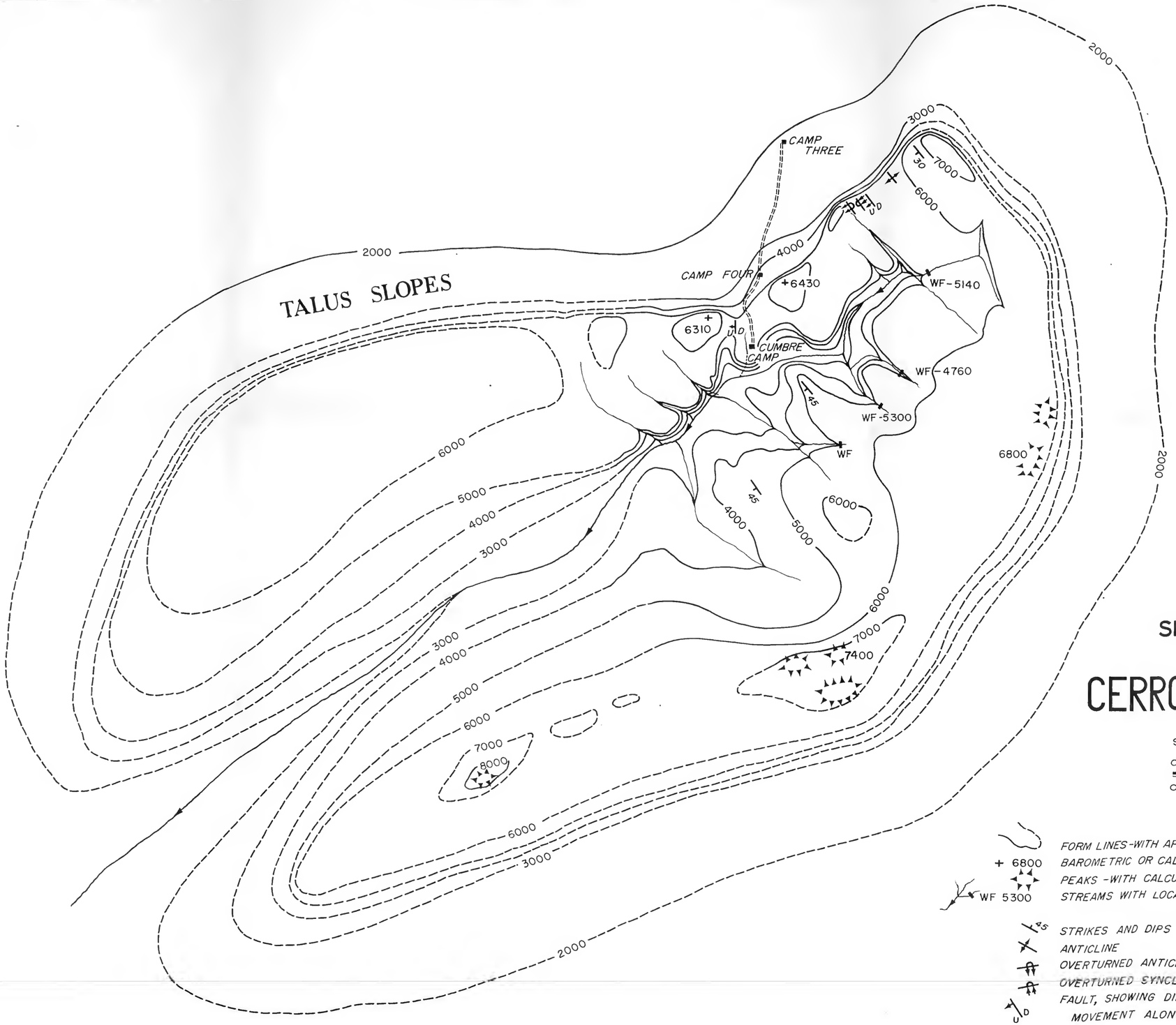


ROUTE of THE PHELPS EXPEDITION, 1954 IN THE TERRITORY of AMAZONAS, VENEZUELA

SCALE 1:4 000 000

KILOMETERS 0 100 200 400

STATUTE MILES 0 100 200



N

SKETCH MAP OF

CERRO DE LA NEBLINA

SCALE 1 : 63 360

0 1 2 3 4 MILES

0 1 2 3 4 5 6 KILOMETERS

FORM LINES-WITH APPROXIMATE VERTICAL INTERVAL OF 1000 FEET.

+ 6800 BAROMETRIC OR CALCULATED ELEVATIONS IN FEET.

PEAKS -WITH CALCULATED ELEVATIONS SHOWN WHEN KNOWN.

WF 5300 STREAMS WITH LOCATIONS AND ELEVATIONS OF WATERFALLS.

STRIKES AND DIPS OF GEOLOGIC STRATA.

ANTICLINE

OVERTURNED ANTICLINE SHOWING DIRECTION OF DIP OF LIMBS.

OVERTURNED SYNCLINE, SHOWING DIRECTION OF DIP OF LIMBS.

FAULT, SHOWING DIRECTION OF DIP, AND RELATIVE MOVEMENT ALONG FAULT PLANE.

2/20/53

Washington
February 14, 1954

Dear Dr. Wetmore,

Friday, I suddenly realized you and Mrs. Wetmore would be arriving at Canal Zone, and the letter I had intended to have there had not even been written. I was so pleased to have your letter written before you left for your Orinoco trip. It sounded like you were having a perfectly delightful time and I surely hope it has continued to be that way. I am sure the trip on the Orinoco must have been exciting and I'm hoping to hear of some of your experiences.

Everything seems to be going as usual at the Smithsonian — I wont say "running smoothly" for, as you know, the Museum thrives on its excitements and turmoils. Dr. Chapin retired on the 31st, with a

quite successful farewell party in Room 43. Even though he protested any party at first, he was pleased as could be to see all his friends, particularly the large numbers of old employees from Agriculture and the Museum who came. The same day Miss Blumenthal retired very suddenly and quietly without previous announcement.

Mr. Kirk has been retired on disability and at the present time is finishing his sick leave. That leaves Mr. Hewitt with the full responsibility down there. He has been having his difficulties with all the construction in the shipping office, on the fur storage room. We hope the worst of the clutter and noise will be over this week.

Mr. Taylor left last week for Germany on an invitation from the Germans through the State Department. He was quite excited about the trip. Al Smith returned from Fiji with his family. Judging from the two large shipments of specimens we

have received and one to come, he was very successful in his work.

Your mail is stacking up, as you can imagine. Jim following your instructions and holding the bulk of it intact. Hardly a week has gone by so far that you haven't received Christmas cards, so you are going to have fun celebrating Christmas in April! Jim trying to keep the mail in some order so it will not be too discouraging for you.

I hope your collecting outfit was waiting for you. We sent it off the week you left so it must have gone through quite promptly. I hope you have a nice time in Panama. It should be a very interesting experience for Mrs. Weltmore.

Remember me to her. I often think how well you two kept your secret — that was one that did not get on the grapevine, which is quite an accomplishment.

My best regards to you both.

Sincerely

Helena Weiss

FIELD OUTFIT - VENEZUELA

Foot locker

2 flat duffel bags
1 duffel bag with handles
laundry bag
2 canvas bags
2 bath towels
5 khaki socks
3 viyella socks
1 woolen socks
2 pajamas
2 pillow cases
8 bandanna handkerchiefs
4 khaki handkerchiefs
3 khaki pants
4 khaki shirts
2 sheets
rope
hunting coat
old oxfords
wading shoes
Aralen
Skinning tools
Extra skinning tools
Preservative
Compass
Film
2 - 32 aux.
1 - 410 aux.
3 cell flashlight
box of tacks
addressed shipping tags
4 insect repellant
2 gun oil
2 spools No.40 linen thread
1 spool No.50 cotton thread
Ambroid
Merthiolate
Lockbar for duffel bag
Waterproof plastic case for camera
2 Film bags
1 ball twine
Hammer
Screwdriver
Flashlight bulbs
Light jacket
Pulvex
Flat file
1 doz. flashlight batteries
Leather dressing
Sleeveless hunting coat
Woolen shirt
Roll scotch tape
2 cakes hand soap

Collecting Chest

2 cans Arsenic and alum
1 box pins (medium size)
3 yds. cheesecloth
3 game bags
1 hank rope
Skin labels
6 Halazone
1 D.D.T. Spray
Hat
Notebook paper
Writing paper
Bird net
Gun
Fleece-lined gun case
Cleaning rod
Fine excelsior
Mosquito net
3 tarps
2 pencils
naphthalene
Wrapping paper
Neck sticks
6 lbs. corn meal

Duffel Bag

Sleeping bag
Blanket
Cover sheet 15' x 15'

Telescope Case

5 cardboard boxes
5 rolls Chinook cotton

Small Telescope Case (marked)

1 roll Chinook cotton
Newspaper

Small Telescope Case
Empty

Small Telegcope Case
Empty

Expedición Phelps.
Lista de Equipaje en el
Viaje al "Cerro Giné"
Territorio Amazonas,-

VIAJE AL "CERRO GIME" TERRITORIO AMAZONAS.

Bultos que salen desde Cdad. Bolívar, al cuidado del Dr. Maguire, para ser depositados en Pto. Ayacucho.-

Caja Negra -I-

I8 Paquetes de Crean wheat
48 Sobres de Sopas Continental
5 Potes Quaker

Caja Negra -2-

7 Potes Quaker
8 ,, Toddy
I ,, Cubos Maggy
6 ,, Leche de 2 y media libra
IO Latas Aceite Vatel

Caja Negra -3-

48 Potes Carne fina
48 Latas Sardinas
Una cobija de Lana del Dr. Phelps

Caja Negra -4-

I2 Rollos de Algodón
Medicinas surtidas

Caja Negra -5-

Tienda de Campaña pequeña.-

Caja Negra -6-

Un toldo Gde. de Lona verde
3 Rollos de algodón
Un poco de tow

Caja Negra-7-

Un toldo Gde. lona Verde
Uno ,, Pequeño
4 Bombitas D.D.T. Shell

Caja Negra -8-

2 Latas de Galletas de Soda
I2 ,, Aceite Vatel

Caja Negra -9-

2 Latas de Galletas de Soda
8 ,, Aceite Vatel
Una caja Baterias de LInternas

Caja Negra -IO-

I2 Latas Mantequilla Mavesa
Un Litro de Vinagre
6 Paquetes de cintica
6 ,, Spaguetti
6 Esponjas de lavar platos
Media gruesa de fosforos
5 frascos de Glim
3 ,, picante
Una botella para batir Toddy
Repuestos Motor Fuera de Borda
Un Batidor de Leche
Una cafetera
Un Rayador de Queso

Caja Negra -11-

6 Paquetes de Sal Molida
1 " Condimientos "Aliños)
1 Zarten de Aluminio
2 Pailas " "
1 Abre Latas

Caja Negra 12-

Cajita de Bajilla Plástica
1 Reloj Bo-Ben
Arsénico y Aserrín
4 Forros de Sillas
4 Tobos de lona

Caja Negra -13-

4 Potes grasa p. motor
1 Ponchera peltre
Botas de Urbano
2 Moralles cacería
1 Saco lona p. agua
2 Colgadores de Hamaca
2 Linternas de frente
Un poco de cabulla
" " Periodicos

Caja Negra -14-

Cigarrillos criollos
12 Velas esperma
2 Globos Lámparas
7 Linternas de mano
1 Abre latas
14 Baterías sueltas (Linternas)
1 Hule Plástico
12 Rollos papel sanitario

Caja Negra -15-

1 Lámpara grande de Kerosene
2 Lámparas pequeñas
1 Hacha
6 Juego cubiertos
12 Mantillas
1 Generador Lamp.
2 Caja de Palitos aplicadores

Guaral y cabulla fina
Cantinplora con Alcohol

Caja Negro -16-

6 Botellas medicina, 5 de una, 1 de otra
Slipink de Urbano
Bagueta limpiar Escopeta
Utiles vaciar huevos
pequeño equipo Taxidermia
Repuestos motor pasadores etc.
Bombillas linterna
3 Libretas anotar pájaros
5 Sueros polivalentes
1 Rollo teipe Celophan
1 altimetro y 2 frascos Henterovioformo

Caja Negra -17-

1 Amplificador.-

Caja Negra -18-

2 Litros aceite (90) para motor F.B.
Etiquetas para hacer
Saquito verde para cartuchos vacíos
Libro de los pájaros
2 Coladores tela para café
2 paquetes servilletas de papel
papel y sobres
Secantes y 3 inyectadoras
2 Limas y plumillas
Una cobija de Lana
meidas de Urbano
Hierros Taxidermía Urbano
un poco arsénico
una libreta anotar pájaros

Bultos de Lona

Bultos de Lona N° 1 Parque
" " " " 2 "

Bultos de Lona N° 3

3 Mesas
4 Sillas
3 Machetes
1 Kg. mecate delgado una
1 Bomba achicar y su manguera

Bultos de Lona N° 4

Escopetas.-

Cajas de Cartón

1-2-3 y 4, Leche de Klim

Cajas 5-6- y 7, Carne de Buey

Caja 8 - Sardinas.

Latas

Lata -1-
8 Kilos de Café Molido
3 Sobres de Sopas Continental

Lata - 2-

8 Kilos de café Molido

Lata -3-

8 Kilos de Café molido
9 Sobres de sopas Continental

Lata -4-

Caraotas Negras
30 Laticas de Sardinas

Lata -5-

Caraotas Negras

Latas 6-7- y 8 con 50 Kilos de Papelón.-

VIAJE AL "CERRO GIME" TERRITORIO AMAZONAS

1 Saco de lona N° 101

4 Sillas aluminio pequeñas
2 Mesas "
1 " Madera
2 Sillas inflables
1 Cantimplora grande de latón
2 Tobos de lona
2 Pancheras de lona

---

1 Saco de lona N° 102

2 Sillas aluminio grandes
1 Asiento W.C.
2 Cojines Kapok rojos

---

1 Saco de lona N° 103 (angosto)

1 Cama pequeña
1 Colchón de aire grande
1 Almohada de aire

---

1 Transmisor N° 104

Caja Plástica gris verdoso

---

1 Caja Negra N° 105

Amplificador
Radiotrones repuestos para el transmisor,
Amplificador, y receptor RCA
Cables eléctricos
Micrófonos
Audífonos

Tierras
Antena para el receptor

Planta Eléctrica

---

1 Caja Negra de fibra

Morral conteniendo:
Antena del transmiser
Cables
Bombillos de luz
Llave de bujías
Sockets de bombillos

---

1 Saco de lona

Varas de antenas de transmiser que no llevamos.

WALTER DUPOUY
APARTADO 328
CARACAS-VENEZUELA

Caracas: Dec.29-1953.

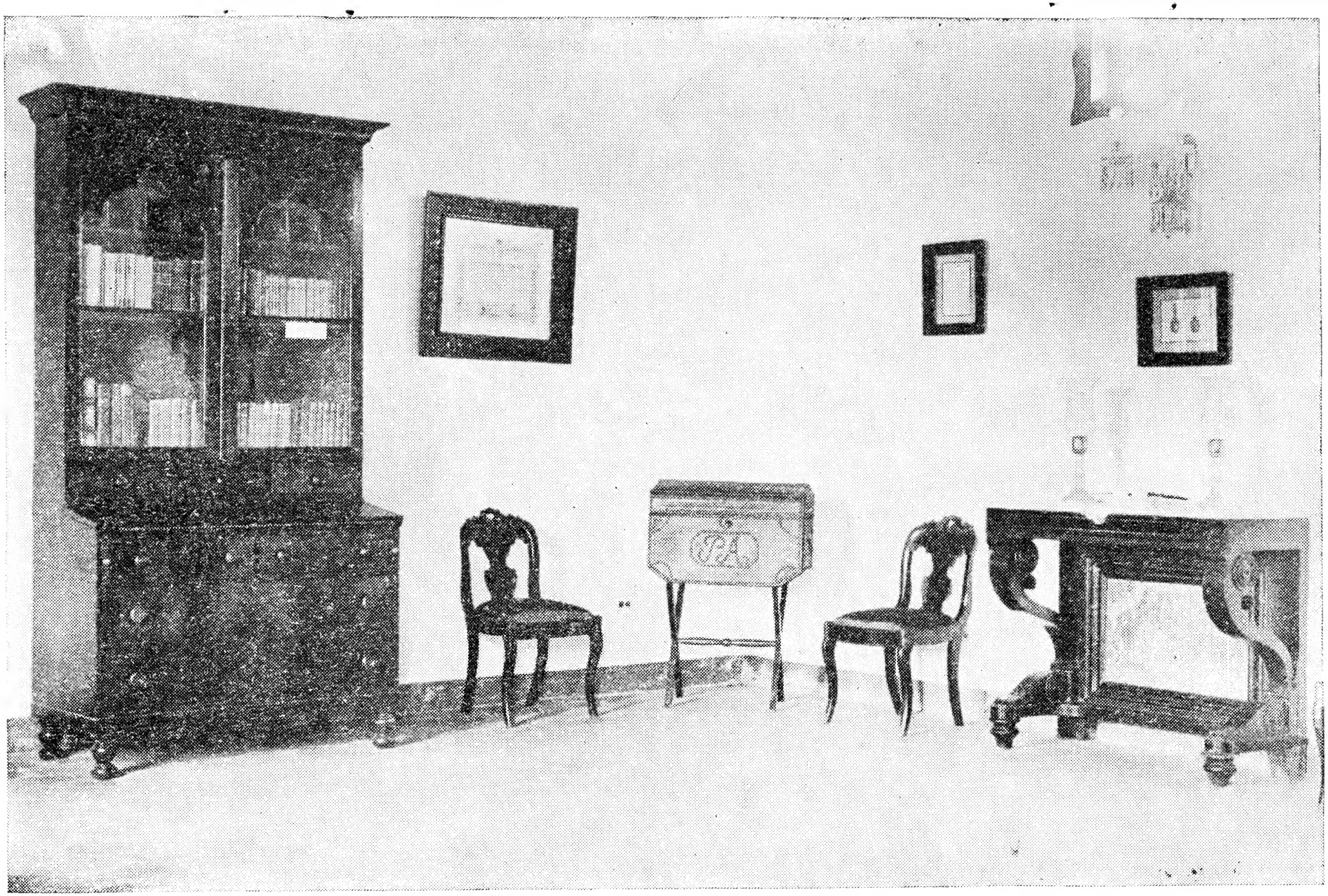
Dr. Alexander Wetmore,
Apartado 2009, Caracas.

Dear Dr. Wetmore:-

I have just received your kind Xmas. & New Year card, which I appreciate very highly. A local paper informed of your recent arrival, so I am sending this post-card to the c/o. Mr. Phelps. I wish you success in the expedition to the Alto Orinoco basin, and health and happiness for the New Year!!

Yours very sincerely,

Walter Dupouy



Un rincón del Museo "Cecilio Acosta", San Diego de Los Altos, Edo. Miranda, Venezuela
(Foto Lor)

Period 1840-1880

Cable Address: Hendersons Curacao N.W.I.

Telephone: 3350 Stad.

Bankers: Holl. Bank Unie (JOHN HENDERSON Piscadera Club)

No. 06520

John Henderson (Curacao) Co. Ltd.

Piscadera Club

Invoice for Mr. Jacks A. Wedmore

c/o Piscadera Bay Club

Date of Arrival Dec. 21st 19 53

" " Departure Dec. 25 " 19 53

Room no. [redacted] Curacao N.W.I.

Board & Lodging Account: 4 days ad f. 40.00 p.

Correction / Addition for

Debit 162.-

Credit 2.-

	Board & Lodging	Coupon books / Slips (Incl. 10% service)	Laundry	Cables postage cash	~~Admission fees~~	5% Service	~~Air condit.~~			Date	Total	Paid
							NDM F0.5					
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		
										11		
										12		
										13		
										14		
										15		
										16		
										17		
										18		
										19		
										20		
										21		
	40.50									22	40.50	
	40.50			9.-						23	50.50	
	40.50		5.50							24	46.-	
	38.50					8.-	3.-			25	51.50	
										26	8.-	
										27		
										28		
										29		
										30		
										31		
Totals	160.-		5.50	9.-		8.-	3.-				105.50	

NED. ANTILLEN F0,05 25/2-53

WADDIE & CO. LTD. 100,000-9-49

Via Airmail

November 30, 1953

Dr. James H. Kempton
American Embassy
Caracas, Venezuela

Dear Jim:

Copy of your despatch No. 719 of November 10, 1953 on "More Restrictions on Travel in the Back Country" has just come to me through the State Department. I note that a permit is necessary for our coming journey and as I am to be with you I assume that you or Billy will have the necessary permission and that I may probably look to Billy to go my bond if this is demanded. I will contribute the one bolívar for the stamp when I see you.

I was in New York on November 24 and had the great luck to find Billy and Kathy there. We ate a leisurely breakfast together in the apartment at their hotel and then spent the forenoon very happily buying equipment down at David Abercrombie's. I was especially pleased to see them since I was able to clear up various details of arrangements which would have taken some time and trouble by correspondence. You must have had a wonderful view down over that country.

I will now tell you one thing that I told Billy and Kathy, which will explain some of the arrangements I have been making, namely, that just prior to my departure I expect to be married again. My wife-to-be is a naturalized American citizen who came originally from Curaçao, and we will spend Christmas there. Kathy and Billy insisted that she come across with me to Caracas to be there through New Year's until the rest of us start for the south, after which she will return to Curaçao to remain with her sister during our trip to the Upper Orinoco.

To avoid unnecessary confusion, discussion, etc. here, this news is not public in Washington and will not be until my departure. I will appreciate it, therefore, if you will remember this if you are writing any letters back here in the meanwhile.

I have my equipment in fair shape now and will start packing as soon as the New York purchases arrive. I think I may have told you that in addition to the outfit I am taking to Venezuela, I am shipping another to Panamá to use during the latter part of February and March on a trip to the Chiriquí volcano. There has been a change in the steamer schedule so that I am sailing now on the SANTA PAULA on December 17, to reach Curacao December 21. We will plan to come across by air, presumably on the 26th. I will have considerable amount of gear with me and will bring the entire outfit from Curacao to Venezuela by air.

Looking forward to seeing you, I am,

Sincerely yours,

A. Wetmore

DR. WALTER A. BLOEDORN

DR. PAUL F. DICKENS

COLUMBIA MEDICAL BUILDING
SUITE 808
WASHINGTON 6, D. C.

November 27, 1953

To Whom It May Concern:

Re: Dr. Alexander Wetmore

This is to certify that Dr. Wetmore is in good physical condition and free from communicable disease.

He has been under my professional care since 1951.

Very sincerely yours,

Walter A. Bloedorn, M. D.

WAB:ss

Health certif.cate

November 20, 1953

Excellency:

I have the honor to inform you that Dr. Alexander Wetmore, Research Associate of the Smithsonian Institution, is proceeding to Venezuela on an official visit on behalf of the Smithsonian Institution.

It will be greatly appreciated if Dr. Wetmore may receive a visa on his Special Passport to facilitate his entry into your country.

Sincerely yours,

Leonard Carmichael
Secretary

His Excellency
Señor Dr. César González
Ambassador E. and P.
Embassy of Venezuela
Washington, D.C.

Smithsonian Institution
Washington 25, D.C.
November 17, 1953

Mr. William H. Phelps Jr.
Apartado 2009
Caracas, Venezuela

Dear Billy:

I amdelighted to have your letter and especially to learn of the grand prospects following your reconnaissance on the Tepui on the Upper Yatua. I can already see in my mind's eye the strange and curious birds that there must be on the summit. Let us hope that those we encounter may be of standard form and that none will have two bills, three legs or an extra tail!

With your letter in hand with the memorandum returned relative to outfit, I can now proceed. I have to be in Cambridge next Monday as a member of the visiting Committee of Harvard College on the Museum of Comparative Zoology, and will come down that night to New York following themeeting. In New York I will have opportunity to buy the additional items of outfit, including the waterproof sheet, etc.

I note what you say relative to ammunition and will take up immediately the question of the .410 aux. I have always depended until now on .32.

I am trying to simplify my collecting supplies so as to avoid trouble in travel and customs as much as possible. Would it be an imposition on you to add one box (25) 16 guage No.4 and one box (25) 16 guage No.8 to the previous list that I sent you. This would take the place of the No.6 shot not available in Caracas. I appreciate your kind statement that the previous ammunition would be "con obsequio de la Colección Phelps". I don't want to trespass on your good nature but I should bevery happy to pay forthe entire lot.

I am tremendously busy in clearing up obligations in the identification of specimens and the preparation of memoranda (ornithological) that I promised tovarious friends, etc., and also in getting my papers and other matters in order. If anything new comes up in the plans, please let me know immediately; in the meanwhile I will keep you informed as to my own progress.

With kindest regards to yourself and Kathy, I am,

Sincerely yours,

A. Vetmore

P.S. The clipping from the Caracas Journal telling of the flight around the mountain arrived as I was about to post this! This is most exciting!

A.

UNITED STATES NATIONAL MUSEUM
BUREAU OF AMERICAN ETHNOLOGY
ASTROPHYSICAL OBSERVATORY
NATIONAL AIR MUSEUM
NATIONAL ZOOLOGICAL PARK

SMITHSONIAN INSTITUTION

Washington 25, D.C.
U.S.A.

NATIONAL GALLERY OF ART
NATIONAL COLLECTION OF FINE ARTS
FREER GALLERY OF ART
INTERNATIONAL EXCHANGE SERVICE
CANAL ZONE BIOLOGICAL AREA

November 17, 1953

Dear Sir:

I enclose herewith Special Passport No. 49179, issued on January 15, 1952 to Alexander Wetmore, formerly Secretary of the Smithsonian Institution and now continuing in retired status as Research Associate of the Institution. Dr. Wetmore is to go to the Netherlands West Indies, Venezuela and Panamá on official work for the Smithsonian Institution. He will be occupied in expeditions concerned with the study of the bird life in these countries.

It will be appreciated if Dr. Wetmore's passport may be validated for travel in the countries mentioned above. He is scheduled to leave the United States on December 17, 1953.

Sincerely yours,

J. E. Gr...

J. E. Graf
Acting Secretary

Chief, Passport Section
Department of State
Winder Building
Washington 25, D.C.

cc. Mr. Wayland B. Waters
Department of State
Walker Johnson Building
Room 413, 1734 New York Ave., N.W.
Washington 25, D.C.

Via Airmail

November 13, 1953

Mr. William H. Phelps, Jr.
Apartado 2009
Caracas, Venezuela

Dear Billy:

I just returned this morning from Cambridge, Mass., where I have completed one of the tasks that I had to finish before getting away for the south, namely, the autum meetings of the National Academy of Sciences which were held at M.I.T. As Home Secretary for the Academy, I still have to complete a lot of detail, but that will be done here in Washington. I will have to make one further trip to Cambridge on November 23 as I am a member of an Advisory Committee on the Museum of Comparative Zoology, the Committee in question having its annual meeting on that date. I will stop in New York for a day on my return to buy a few things and then will be in a position to pack up the outfit.

I wrote you that I expected to come down by steamer. I am pleased to write that I now have passage on the Grace Line SS. SANTA ROSA, sailing from New York December 17. The boat touches first at Curaçao and, as I mentioned in mine of November 2, I will need to spend Christmas there. I expect to come across by air, presumably on December 26, to Maiquetía and plan to have my outfit on the same plane as air freight. I hope to hear from you soon relative to the questions that I asked in mine of November 2.

I have just received a letter from Charlie Hitchcock, in which he indicates that the reconnaissance flight to the new mountain proved highly interesting, although he gives me no details.

On my return to the office this morning I find that my labels are ready; I also have the black-and-white film I will use. The first of the week I will get together the last of the collecting outfit. I may assure you that I am looking forward to this with much enthusiasm.

I saw Serge Korff at a meeting a week ago and he asked especially to be remembered to you and to Kathy.

Sincerely yours,

A. Wetmore
Research Associate

Via Airmail

November 13, 1953

Dr. James H. Kempton
c/o. American Embassy
Caracas, Venezuela

Dear Jim:

A week ago I prepared a letter to you relative to my plans but then some uncertainty as to schedule developed and it was necessary to hold the letter until I had firm information. In the meantime I was under necessity of spending most of this week at the fall meetings of the National Academy of Sciences in Cambridge, Mass.

I am pleased to write that I now have steamer passage on the Grace Line ss. SANTA ROSA, sailing from New York Thursday, December 17. This will bring me down a little earlier than I had anticipated originally. For reasons that I will explain to you a little later, I will need to spend Christmas in Curaçao where the steamer touches before it goes to La Guaira, and will then cross to Venezuela by air, presumably on Saturday, December 26. I am bringing down my field equipment by boat and will have it with me as air freight when I cross by plane to Maiquetía. The gun will be packed in a footlocker with field clothing, etc.

As Home Secretary of the National Academy of Sciences I still have to clear up various details concerned with the autumn meeting which has just closed, but I am now down to a point where I can plan the final details for the trip with you and for the collecting expedition that I expect to make into Chiriquí when we are through in Venezuela.

Not much else in the way of news at the moment. I expect to write you a little later with more details.

Sincerely yours,

A. Wetmore
Research Associate

Air Pouch
PRIORITY

UNCLASSIFIED
(Security Classification)

DO NOT TYPE IN THIS SPACE
831.181/11-1053
XR 031.0031

FOREIGN SERVICE DESPATCH

719
DESP. NO.

FROM : CARACAS, VENEZUELA

TO : THE DEPARTMENT OF STATE, WASHINGTON.

November 10, 1953
DATE

REF : -------

For Dept. Use Only	ACTION	DEPT.
13	ARA-4	DC/R.2 OLI-6 PD-1
REC'D 11/14	INFO OTHER	CIA.5 COM-8 IN-5 SM-1

INSTITUTION
NOV 2 1953

SUBJECT: MORE RESTRICTIONS ON TRAVEL IN THE BACK COUNTRY

031.0031 ARA

Since July 27, 1951 (despatch No. 167 July 25, 1952) anyone, Venezuelan or alien, visiting areas of Venezuela occupied by indigenous populations (Indians) must have a prior permit issued by the Ministry of Justice. These permits are required regardless of the traveler's field of interest and are designed to give the government some sort of control over those contacting the Indians. This control is felt to be necessary because some of the Indians are hostile (Motilones), some are non-cooperative (Guahibos) and all are more or less without official resident protection. Many of the Mairitares on the Cunucunuma were wiped out last year by an itinerant peddlar with measles.

For the purpose of obtaining a permit the petitioner must file a statement in Spanish typed on official paper and bearing a cancelled fiscal stamp for 1.00 bolívar (30 U.S. cents). To this requirement has now been added the further provision that the petitioner must be bonded by a Venezuelan properly qualified financially to make payment of the bond if demanded. This latest requirement is designed to enforce the provision of the permit that requires the permitee to submit to the Ministry of Justice a report on his expedition upon its termination. The Ministry has discovered that these required reports are regularly overlooked by expeditionists once they have escaped from the regions of the back country and returned to their parent museums.

It is the idea of the Ministry to gradually build up its records as to who visited whom in the Indian country, how they traveled, what they saw and accomplished. It is not the intention of the Ministry that full scientific reports be made on the achievements of these expeditions but rather more general accounts that will assist the officials in keeping their knowledge of the Indians and of travel conditions more or less current. These requirements should be brought to the attention of all those seeking passports for travel in the back country of Venezuela.

For the Ambassador:
J H Kempton
James H. Kempton,
Agricultural Attaché

JHKempton:mz
REPORTER

UNCLASSIFIED

INFORMATION COPY
Retain in divisional files or destroy in accordance with security regulations

COLECCION ORNITOLOGICA PHELPS

WILLIAM H. PHELPS
WILLIAM H. PHELPS, JR.

APARTADO 2009
CARACAS, VENEZUELA

Noviembre 10 de 1953

Sr. Dr. Alexander Wetmore
Smithsonian Institution
Washington 25, D. C.

Muy estimado amigo:

Acabo de recibir su atenta carta del 2 de Noviembre con la mágnifica noticia de que usted nos acompañará en la expedición a las cabeceras del Río Pacimoni (Yatúa)

Mi padre llega esta tarde de la Florida donde pasó algunos días después de la reunión del AOU. Ojalá él quiera acompañarnos aunque sea durante dos semanas de la expedición pues estoy seguro de que esa parte del viaje será sumamente cómoda y sin dificultades.

Kathy y yo hubiéramos querido que usted pasará las Navidades con nosotros en Caracas, pero de todos modos, ya que Ud. las pasará en Curazao, contamos con su compañía para recibir juntos el Año Nuevo, y por supuesto esperamos que Ud. llegará a Caracas varios días antes de esa fecha.

Todavía estamos sumamente ocupados con la estación de Televisión que parece saldrá al aire definitivamente con programas comerciales dentro de 5 días. Por supuesto que los problemas relacionados con una instalación tan complicada continuarán, pero sinceramente espero que, en lo que se refiere a mí personalmente, no requerirá de ahora en adelante una atención tan minuciosa. Muchas gracias por el artículo tan interesante que me envió relacionado con la Educación por medio de Televisión. Lo tendré muy en cuenta y lo pasaré a los directores de esa empresa.

Con relación al memorandum que usted me envió le devuelvo una copia con las contestaciones necesarias.

Con relación a los cartuchos 16 gauge le estoy haciendo preparar por Ramón Urbano 25 cartuchos con municiones 4 y 50 cartuchos con munición 8. Desafortunadamente no tenemos, ni se consigue en Caracas munición N° 6 por consiguiente recomiendo que Ud. adquiera estos 50 cartuchos en los Estados Unidos. Espero que Ud. traerá 2 "auxiliary barrels" para usar cartuchos .410 en su escopeta 16 gauge pues llevaremos muchos cartuchos .410 para uso de la expedición. Como también llevaremos cartuchos .22 quizás Ud. desée traer alguna auxiliar para poder usar esos pequeños cartuchos en las escopetas 16.

Dr. Alexander Wettmore Nov. 11/53

La semana pasada tuve la incomparable experiencia de sobrevolar, con Jim Kempton y otros amigos, la región de las cabeceras del Río Pacimoni y allí vimos grandes serranías y algunos cerros de más de 6.000 pies de altura, de arenisca (sandstone) típicos de la formación de los Tepuis del resto de la Guayana venezolana. El problema para nosotros será aproximarnos por agua a las faldas de ese gran cerro, pero como vamos siguiendo los pasos de Maguire confío en que el camino estará bastante abierto por él cuando nosotros lleguemos a la región. Los pequeños riachuelos que corren hacia el Norte, desde la región del cerro Imei, se pierden rápidamente en la selva y desaparecen por completo debido a la densa vegetación. Ojalá sean navegables hasta algunos puntos cerca de una de esas grandes serranías pues estoy convencido que tendremos sorpresas ornitológicas muy agradables si llegamos a acercarnos a la cumbre.

Con saludos cariñosos en los que me acompaña Kathy, me repito su afmo. amigo,

de vista

WHPJr:ggm.-

Billy:

1. Should I bring a light weight sleeping bag? Yes

2. Will I need a light weight waterproof sheet to place above hammock.

If so, what size? Yes about 15 x 15 ft. of the lightest possible egyptian cloth.

the Rockefeller Collection is delighted to supply to you

3. ~~Can you purchase at my expense~~ the following ammunition in Caracas?

16 guage, smokeless powder No.4 chilled shot - 1 box (25 shells) Yes

~~" " " " No.6 " " - 2 bxs. (50 shells) No~~

" " " " No.8 " " - 2 bxs. (50 shells) Yes

4. Will you have usual medicine kit? Yes . If you wish to bring a small additional one, fine. There will be plenty of room on the Catalina & on the Falcas.

A.W.

American Geographical Society
BROADWAY AT 156TH STREET, NEW YORK 32, N.Y.

OFFICE OF THE DIRECTOR ADIRONDACK 4-8100

November 9, 1953

Dr. A. Wetmore
Research Associate
Smithsonian Institution
Washington 25, D. C.

Dear Dr. Wetmore:

Thank you very much for your thought in writing to me.

I imagine you have been receiving news from our mutual friend Billy Phelps, Jr. The latest installment to me was certainly a wonder-full description of his recent flight of discovery to the new mountain on the Venezuela-Brazil boundary. I would like to publish it in the Geographical Review if our editor would only relent.

Sincerely yours,

Charles B. Hitchcock

Charles B. Hitchcock
Director

CBH:o'd

Via Airmail

2 November 1953

Mr. William H. Phelps, Jr.
Apartado 2009
Caracas, Venezuela

Dear Billy:

Your first communication relative to the Orinoco trip was forwarded to me in San Francisco, where I had gone prior to the A.O.U. meeting, to examine a collection of birds from western Panamá. Your father gave me the second one with the revised schedule when we were together in Los Angeles. Needless to say, I have been delighted to learn of the expedition and especially happy that you and Kathy have included me in the personnel.

I came home from the West a week ago so that last Tuesday was my first day in the office. I returned for a series of meetings that I had to attend, and in between started the wheels turning on the necessary arrangements for the trip since time is short. This will explain why I have not written you earlier since in the time I had available between these meetings, I had to get various things moving.

Immediately on receipt of your first letter I wrote to Jim Kempton about bringing in a 16 guage shotgun and have furnished him thenecessary information on make and number so that he may apply for an import permit for me. I am going to try to come down by steamer in order to bring the field outfit in most easily, provided that I may be able to secure transportation. The time is a little difficult since the holiday season is a chosen period for cruise passengers. I will let you know a little later as soon as I can, what I have been able to secure in the way of transportation, but will say now that I will be under necessity, for reasons which I will explain to you later, of spending Christmas in Curaçao. I will expect to send my gear forward as unaccompanied baggage and then cross by air from Curaçao immediately following Christmas. I should then have sufficient time in Caracas prior to departure on January 2.

I am busy at the moment with the details of two field outfits, one to take to Venezuela and the other to be shipped by ocean freight to Panamá where it will be held until I come across by air after the Orinoco trip. After talking with your father in Los Angeles, I will probably find it easier to arrange to cross again to Curaçao by steamer, taking the Venezuelan gear with me and then ship it north from Curaçao. Through connections I have there I will have no difficulty in getting the material sent forward by freight.

You told me something a year ago about the pressure on you to develop a television station and I wish you all success in this expensive undertaking. I am sure it will be successful when I see how widespread television is in

this country. As a matter of possible interest I enclose herewith a sheet from a recent issue of "Science" that tells something about educational programs on television. This might be of possible interest to Guillermo Zuluaga.

Printed labels for the Venezuela trip have just come in from the printer and I send you one herewith as indication of some of the things I have been doing. They still have to be strung.

I also enclose two copies of a brief memo with some questions. You can fill in very quickly the information wanted on one of them and let me have it back. I will appreciate it if this can be done promptly.

I am certainly looking forward to being with you again and to a sight of the wonderful Upper Orinoco country.

Sincerely yours,

A. Wetmore
Research Associate

Enclosures

Billy

1. Should d bring a light weight sleeping bag?

2. Will d need a light weight ~~shoe~~ water proof shirt to place above hammock?
   If so, what size?

3. Can you purchase at my expense the following ammunition in Caracas?

16 gauge,	smokeless powder	#4 chilled shot	1 box (25 shells)
" "	" "	#6 " "	2 " (50 shells)
" "	" "	#8 " "	2 " (50 shells)

4. Will you have usual medicine kit?

October 30, 1952

Mr. James H. Kempton,
c/o American Embassy,
Caracas, Venezuela.

Dear Jim:

Possibly you will have seen Billy and Kathy Phelps by the time this reaches you and so will know that we are fully embarked on plans for the expedition to the upper Orinoco this coming January. The only thing that remains to make this proposal complete is the assurance that you yourself are going to accompany us. I believe I have told you that Billy sprung this on me at breakfast the morning that I left Caracas last month. We went into details during our recent meeting in Baton Rouge, Louisiana.

What I am writing to ask now is this. I plan to come down myself by air and will need to ship a certain amount of field gear down ahead of time by ocean freight. This will include a shotgun (with a spare in case of accident), ammunition, field clothing, and the case that I need to prepare specimens, etc. Will it be practicable for me to ship this c/o American Embassy and, if so, how should the lot be addressed. I would expect to make shipment sometime in early December so as to avoid the Christmas rush.

The proposition is one that is certainly intriguing and one that should give me a grand lot of experience.

I am pleased to write that I have had no recurrence of malaria and that I seem to be operating under full steam ahead, as usual.

Let me know regarding the shipment as soon as you can.

Sincerely yours,

A. Wetmore,
Secretary.

hs

Via Airmail

October 29, 1953

Dr. James H. Kempton
American Embassy
Caracas, Venezuela

Dear Jim:

Yours of October 16 came to me in Los Angeles and I appreciate your attention. Your suggestion as to getting a gun permit is a sage one, but I have had to delay giving you the necessary information until I was back here in Washington where the gun which I shall bring is available.

The gun in question is a 16 gauge No. 202798, manufactured by the Savage Arms Corporation.

I am not at all sure as yet as to how I will come or the dates as that will have to be arranged according to transportation available. Billy sent on his revised schedule calling for departure from Caracas on January 2. This complicates things somewhat since steamer travel through the holiday period is cluttered up with cruise tourists.

The indications are that the journey will be quite a safari - I am looking forward to it.

Sin más por el momento, estimado amigo, quedo siempre su afmo.

Alejandro Wetmore
Asociado en Investigaciones
Científicas

Form 703
Smithsonian Institution
Supply Division
September 15, 1952

COPY

PURCHASE ORDER

SMITHSONIAN INSTITUTION
WASHINGTON 25, D. C.

METHOD OF PURCHASE Form Approved Budget Bureau No. 48-R101

Indicate Method by Number
1. General Schedule of Supplies
2. Treasury Procurement Stock
3. Surplus Property Transfer
4. Advertising (R.S. §3709)
5. War Powers Negotiation
6. Other Exemption from R.S. §3709
7. Miscellaneous
(See Treas. Proc. Circ. Ltr. No. 722)

This number must appear on all **PACKAGES** and **PAPERS** relating to this order.

ORDER NO. 29345

DATE Oct. 27, 1953

REQUISITION NO. 87

APPROPRIATION SYMBOL AND TITLE
3340100.001
SALARIES & EXPENSES, SMITHSONIAN INSTITUTION 1954

ALLOTMENT
Serv. Div 08.2

TO SELLER
General Aniline & Film Corp.
Ansco Division
736 Woodward Bldg.
Washington 5, D C.

CONSIGNEE AND DESTINATION
SHIP TO
SUPPLY DIVISION
SMITHSONIAN INSTITUTION
10TH ST. & CONSTITUTION AVE., N. W.
WASHINGTON 25, D. C.

INVITATION NO.	CONTRACT NO.	TIME FOR DELIVERY	DISCOUNT TERMS
	GS-03S-8674		

F.O.B. POINT	SHIP VIA	GOVT. B/L NO.

ITEM NO.	ARTICLES OR SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
18-F-37375-35	Film, photo, color No. 120	10	roll	$ .76	$ 7.60
				TOTAL	$ 7.60

BILLING INSTRUCTIONS — **All invoices should be forwarded promptly to the Accounting Division, Smithsonian Institution, Washington 25, D. C., in duplicate, the original certified as follows:**

I CERTIFY THAT THE ABOVE BILL IS CORRECT AND JUST;
THAT PAYMENT THEREFOR HAS NOT BEEN RECEIVED.

Complete name of firm, followed by signature in ink of owner or administrative officer and his title.

Example: The Smith Company, Inc.
by (signed) Henry White, Bookkeeper

Failure to comply with the above instructions will necessitate return of invoice for proper certification and will result in delay in payment of your account.

SIGNATURE

NAME

TITLE

SMITHSONIAN INSTITUTION
WASHINGTON 25, D. C.

This number must appear on all *PACKAGES* and *PAPERS* relating to this order.

ORDER NO. 20412

DATE OCT 27 1953

PURCHASE ORDER

TO SELLER

Eastman Kodak Co.
444 Shoreham Bldg.
Washington 5, D. C.

CONSIGNEE AND DESTINATION

SHIP TO

SUPPLY DIVISION
SMITHSONIAN INSTITUTION
10TH ST. & CONSTITUTION AVE., N. W.
WASHINGTON 25, D. C.

FUND	REQUIRED BY	TIME FOR DELIVERY	DISCOUNT TERMS
	Cont. No. GS-038-8670		

F. O. B. POINT	SHIP VIA	GOVT. B/L NO.

ITEM NO.	ARTICLES OR SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
18-F-36520	Film, translucent, Kodak Translite; 11 x 14 inches; pkg of 10 sheets	2	pkg.	$ 3.35	$ 6.70
18-F-38160-60	Film, panchromatic, Kodak Plus-X, No. PX 120 (Plus-X film to be individually tropical-packed.)	50	roll	.37	18.50
			TOTAL		$25.20

INVOICES IN TRIPLICATE SHOULD BE SUBMITTED PROMPTLY AFTER DELIVERY OF SUPPLIES/OR SERVICES

SIGNATURE

NAME

TITLE

U. S. GOVERNMENT PRINTING OFFICE 16—35413-4

Alex: Bob Bell, Jim Phelps, Jim Maguire, Stan Paul Tussey

Veltrino

MEMORANDUM SOBRE EL PROYECTADO VIAJE A LA REGION DEL CAÑO CASIQUIARE, LOS RIOS PACIMONI Y YATUA Y EL CERRO JIMÉ.

Caracas: Octubre 17 de 1953.-

ITINERARIO PHELPS : 1.954

Sábado Enero 2 Llegada Esmeralda en avión.

Enero 2 Salida Esmeralda en falca de Maguire.

Enero 5 Llegada a Boca Pacimoni .

Enero 8 llegada base campamento Yatúa.

Enero 10 llegada campamento cumbre Jimé.

Enero 20 salida del campamento cumbre Jimé

(Urbano y Márquez permanecen en este campamento y regresan con Maguire)

Enero 22 llegada campamento base río Yatúa.

Enero 28 llegada Maróa.

Febrero 1° (?) salida Maróa llegada Pimichín

Febrero (?) salida Pimichín llegada Yavita

Febrero 3 (?) salida Yavita.

Febrero 6(?) llegada Sanf Fernado de Atabapo

ITINERARIO MAGUIRE: Viernes Octubre 30 avión Embajada Americana sale de Caracas para Ciudad Bolivar en la tarde para vuelo Cerro Jimé.

Sábado Octubre 31 vuelo Ciudad Bolivar-Cerro Jimé (salida 5:30 a.m. Regresa mediodía)

Noviembre 1° repetir viajes sí necesario.

ITINERARIO MAGUIRE ALTO ORINOCO: Sábado Noviembre 7 salida Ciudad Bolivar para Pto. Ayacucho vapor fluvial.

Noviembre 11 llegada Pto. Ayacucho.

Memorandum sobre el proyectado viaj...

Itinerario Maguire Alto Orinoco : Noviembre 13 llegada San Fernando.
Noviembre 20 llegada Boca Pacimoni
Noviembre 30 llegada Campamento base río Yatúa
Diciembre 15 llegda campamento cumbre cerro Jimé
Febrero 15 salida de campamento cubre cerro Jimé
Marzo 1° llegda Ciudad Bolivar.

ITINERARIO PHELPS SR. Y GUILLERMO ZULOAGA: Enero 2 llegada Esmeralda por avión siguiendo con el resto del grupo según Itinerario Phelps, Enero 8 llegada campamento base Yatúa.
Enero 9 salida de campamento base Yatúa en falca pequeña.
Enero 12 llegada boca Pacimoni.
Enero 12 salida boca pa c imoni en falca grande (que ha estado esperando en la boca todo el tiempo)
Enero 16 llegda Esmeralda.
Enero 17 salida Esmeralda en avión.

NOTAS VARIAS

INTEGRANTES DE LA EXPEDICION: Williaam H. Phelps Jr.
Kathleen de Phelps
William H. Phelps
Alexander LWettmore
Charles B. Hitchcock

Memorandum sobre el proyectado viaje...

Integrantes de la expedición: Rafel Ernesto López

James Kempton

Guillermo Zuloaga

Ramón Urbano
(Jefe Taxidermista)

Audio Márquez
(Ayudante)

Enviar gasolina con equipo cacería embarcados con Maguire desde Ciudad Bolivar hastą Puerto Ayacucho.

Maguire tendrá dos falcas:
Una de 48 pies - 3.1/2 a 4 toneladas - mo6or de 25 HP.
Una de 1.1/2 toneladas - motor de 10 HP.

Comprar motor de 25 HP.

Enviar a Esmeralda en falca grande 10 tambores de gasolina mezclada que usará la falca grande de Maguire en sus viajes con el grupo Phekps.

La falca en el viaje Sanariapo - Esmeralda necesitará 3 tambores de gasolina mexclada.

Se calcula en 7 días el viaje de la Boca del Pacimoni a San Fernando de Atabapo.

Bastimento por comprar y enviar a Esmeralda junto con la falca que lleva los 10 tambores ádicionales de gasolina mexclada.

Memorandum sobre el proyectado viaje...

Bastimento por comprar etc....: 100 kilos arroz

25 kilos caraotas

96 latas Corn beef

48 latas Spam

144 latas sardinas

30 kilos papelón (?) (probablemente más)

12 latas Quaker Oats

60 latascream of wheat

18 latas klim 5 libras

24 kilos cafe enlatado

Té

48 sobres sopas deshidratadas

6 latas Toddy

Casabe (maguire comprará)

Mañoco (maguire comprará)

Cebollas. Ajos.

Cubos de bullion

Alimento deshidratado

Mantequilla (Mavesa)

Aceite de comer (Vatel)

Además para aumentar las provisiones de Maguire debido a que Urbano y Márquez permanecerán con ellos durante 5 semanas:

1: Todo el bastimento que sobre de lo especificado arriba y además:

48 latas de Corn beef

10 latas Klim 5 libras

10 kilos cafe enlatado

12 sobres sopa deshidratada

2 latas Toddy.

THE FOREIGN SERVICE
OF THE
UNITED STATES OF AMERICA

AMERICAN EMBASSY,
Caracas, Venezuela,
October 16, 1953

ADDRESS OFFICIAL COMMUNICATIONS TO

Dear Alex:

Your letter arrived just at closing time Friday night, so I'm rushing off this note to catch you in L.A.

The Phelps man at La Guaira has been very successful in getting stuff through the aduana but just to make sure there is no hitch, why don't you write me a letter giving the number and bore of your shot gun and I will ask the Venezuelan authorities to grant an import permit. That way we will have two barrels to our gun.

I'm looking forward to seeing you, and Billy has everything set. October 30 we all fly with Maguire down to the Brazilian border in Amazonas to find Maguire's mountain.

Regards,

James H. Kempton

Dr. Alexander Wetmore,
Hotel Ambassador,
Los Angeles,
Calif.
EE.UU.

WILLIAM H. PHELPS, JR.
APARTADO 2009
CARACAS

Octubre 2 de 1953

Sr. Dr. Alexander Wttmore
Smithsonian Institution
Washington 25, D. C.

Muy estimado amigo:

Ya he empezado a tomar los pasos necesarios para la preparación de nuestro viaje al Alto Orinoco. Actualmente estoy sumamente ocupado con una estación de televisión que estamos instalando en Caracas y espero que para mediados de Diciembre, que es cuando esperamos comenzar el viaje, estaré libre de tantos compromisos. De todas maneras, si por alguna razón especial yo no pueda ir, la expedición se llevaría a cabo de todos modos.

La copia de la carta adjunta le dirá en líneas generales el proyecto del viaje. Lo mantendré informado a medida que se vayan desarrollando los planes.

Lamento que, por primera vez en muchos años, no podré asistir a la reunión del AOU este año.

Con un cordial abrazo me repito su afmo. amigo,

WHP Jr.:agm.

P.S. There are plans for air reconnaissance I the region in November, in an Am. Embassy plane. As yan Kuan, Maguire saw a very high "tepui" near the frontier, S. & the Casiquiare and wants to get there. So do I but I want to be shown that it is high and reasonably accessible by water.

Wetmore

Setiembre 28 de 1953.

Sr. Pedro Rafael Moreno, hijo
Puerto Ayacucho

Mi estimado amigo:

Durante este verano por fin como que vamos a regresar al Territorio Amazonas, y esta vez espero que Ud. pueda acompañarnos, aunque sea durante parte de nuestro viaje.

Tengo en proyecto un viaje "facil" que sería el siguiente: Llegar en avión hasta San Fernando de Atabapo (recogiéndolo a Ud. de paso en Puerto Ayacucho, en línea Aeropostal Venezolana); embarcarnos en falcas en San Fernando Atabapo; remontar el Orinoco hasta La Esmeralda, al pie del cerro Duida; bajar por el Casiquiare hasta la desembocadura del Pacimoni o el Siapa; remontar uno de estos ríos durante una semana más o menos; descender este río hasta el Casiquiare; bajar el Casiquiare hasta su confluencia con el Guainía; remontar el Guainía hasta Maroa; atravesar la pica Yavita-Pimichin; embarcarnos de nuevo en el río Temi; bajar el río Temi hasta su confluencia con el Atabapo; bajar el Atabapo hasta San Fernando; tomar el avión de regreso a Puerto Ayacucho y Caracas.

En el viaje esperamos ir las siguientes personas: Sr. Pedro Rafael Moreno, hijo; mi señora; yó; mi padre; el Dr. Alexander Wettmore, de la Institución Smithsoniana de Washington; el Dr. Rafael Ernesto López; el Dr. James Kempton, Agregado de Agricultura de la Embajada de los Estados Unidos en Venezuela; el Dr. Charles B. Hitchcock, Director de la Sociedad Geográfica Americana; Ramón Urbano; un taxidermista adicional. Como usted vé, habrá un gentío y por consiguiente necesitaremos una falca muy grande o quizas sería preferible dos falcas grandes.

Crée usted que se podrán alquilar estas falcas en Puerto Ayacucho, en Sanariapo, o en San Fernando de Atabapo para efectuar ese viaje? Habrá que tener en cuenta que se necesitarán embarcaciones para recogernos después de haber hecho la travesía a pie de la pica Yavita-Pimichin, es decir en el río Temi para descender el Atabapo hasta San Fernando.

Sr. Pedro R. Moreno hijo Set. 28/53

El Dr. Maguire tiene también el proyecto de ir a la región del Alto Orinoco y tengo entendido que ya ha contratado los servicios de Iginio para que lo acompañe. Probablemente Iginio pueda ayudarnos a obtener información sobre el alquiler de las falcas que necesitaremos.

Tengo la intención de salir de Caracas durante la primera mitad del mes de Diciembre y pasar las Navidades, Año Nuevo, etc., durante el viaje para regresar a Caracas a fines del mes de Enero.

Mucho agradeceré se sirva hacerme el favor de ayudarnos una vez más en estas gestiones y confío en que usted podrá acompañarnos esta vez.

Con saludos cordiales y agradeciéndole de antemano las molestias que de nuevo le ocasiono me repito su afmo. amigo,

William H. Phelps, Jr.

WHPJr:ggm.